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TACTICAL AIRPOWER AT THE OPERATIONAL LEVEL OF WAR

A Thesis Presented to the Faculty of the U.S. Army
Command and General Staff College in partial
fulfillment of the requirements for the
degree

MASTER OF MILITARY ART AND SCIENCE

by

DANIEL W. JORDAN, MAJ, USAF
B.S., United States Air Force Academy, 1976
M.HRM., Pepperdine University, 1981

Fort Leavenworth, Kansas
1990

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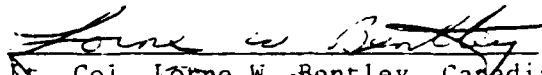
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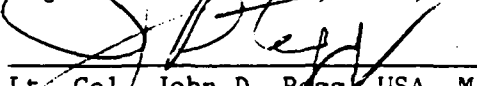
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The opinions and conclusions expressed herein are those of the student author and do not necessarily represent the views of the U.S. Army Command and General Staff College or any other governmental agency.

ABSTRACT

TACTICAL AIRPOWER AT THE OPERATIONAL LEVEL OF WAR, by Major Daniel W. Jordan III, USAF, 211 pages.

This thesis investigates the question: How can Tactical Air Forces (TAF) best support the Operational Commander in his maneuver of large ground forces? It defines the framework and activities of the operational level of war as a self-contained and synergistic system. Within that system, the conduct of air and land operations using maneuver theory is examined. Various operational offensive maneuvers (penetration, envelopment and frontal attacks) and defensive situations (retrograde operations, attack into a salient, and breakout from the encirclement) have been laid out. By comparing these situations against the various stages of air superiority, the thesis analyzes the spectrum of airpower options in those scenarios.

The conclusions are: (1) Until air superiority is gained, the operational commander does not have freedom of action in the operational rear. (2) The TAF may have to become the operational main effort while ground forces are consolidating. (3) Airpower can take away the enemy's freedom of action in the air and on the ground. (4) Ground forces have the ability to create freedom of action for TACAIR at the tactical and operational level of war. (5) TACAIR may need the dedicated support of both air and ground forces to concentrate and cross a heavily defended FLOT.



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CHAPTER ONE

INTRODUCTION

This thesis investigates the question: How can Tactical Air Forces (TAF) best support the Operational Commander in his maneuver of large ground forces? It defines the framework and activities of the operational level of war as a system, self-contained, and synergistic. Using maneuver theory, the operational commander conducts operations inside of that system. Using the elements of maneuver theory, airpower is analyzed as an integral component of the system. Various operational ground maneuvers, both offensive and defensive have been laid out, and airpower analyzed against them. The thesis concludes that airpower and ground forces are not mutually exclusive; that they create conditions in which both components can successfully operate at the operational level. The specific conclusions of this conceptual analysis are as follows.

1. Except in very rare situations, operational maneuver in mid-high intensity warfare will always require some measure of air superiority to be successful.
2. Until air superiority is gained, the operational commander does not have freedom of action in the operational rear for either his ground or his air forces.

3. In order to gain air superiority, the TAF may have to become the operational main effort while ground forces are consolidating.
4. Airpower offers the operational commander the ability to go offensive in the enemy's operational rear to take away the enemy's freedom of action in the air and on the ground.
5. Tactical Air (TACAIR) may need the dedicated support of both air and ground forces to concentrate and cross a heavily defended FLOT. This requires that SEAD become a major operational activity in ground holding force sectors.
6. Ground forces have the ability to create freedom of action for TACAIR at the tactical and operational level of war.
7. In conditions when the enemy has air superiority, consideration for major operational maneuvers will have to be weighed against the potential loss to both air and ground forces to large battles of attrition.
8. Individual battles in the air or on the ground will probably have no immediate effect on the other. However, major operations have significant impact on the capabilities of each ground and air force.
9. The operational employment of airpower can create the conditions for success for a ground force at the tactical level. This, in turn, can insure success at the operational level of war.

Successful military operations require the coordinated and rapid orchestration of air and ground forces over considerable distances. While western armed forces are primarily defensive in their outlook, military forces in pursuit of political aims must win something, or there would be no basis from which political authorities could bargain to win politically. Therefore, military action has a purpose; it cannot be avoided. Strategies must be designed to preserve "for the defender, the territory, resources, and facilities of the defended area."¹

Very little has been written about the complex interaction between ground forces and air forces at the operational level. Yet, with the increasing capability of surface air defenses, it seems only logical that the air and ground components of an operational force must work closer together. Air Force writers tend to write about the air superiority campaign, the air interdiction campaign, and the suppression of enemy theater air defenses from a very specific, tactical level point of view. Most of these writings discuss doctrinal conflicts. Others discuss the relative merits of one Tactical Air Force (TAF) mission over another. Still others focus on the integration of apportionment and allocation of tactical sorties at the theater level.²

By the same token, writers with a focus on ground operations tend to write extensively on the land campaign, combined arms (from a ground perspective), mobility and logistics. An army officer's focus is on the effective integration of the multitude of battlefield systems he has to manage: fire support, logistics, intelligence, mobility. Consequently, when he thinks of air power, his focus is usually on one of two things: airlift or firepower for his tactical maneuver.

If the two services have been so successful in the past, why should they change their focus to the operational level of war? There are several reasons why this discourse should be started. A theater/operational commander will never have enough assets to fight the war the way he wants to fight it. In days of declining force structure, the operational movement of corps-sized units across a battlefield to achieve operational

objectives and the tactical air support of those units are some of his prime concerns.

This is especially true when strategic objectives require the defeat of enemy armed forces or the seizure of key terrain. The traditional strategic missions of interdiction against the enemy's warfighting capability may not apply if the enemy is also trying to achieve short term operational objectives as soon as possible. In order to bring a quick end to a conflict, secure strategic political objectives, and minimize loss of lives, the spectrum of TAF missions must be considered in that context.

THE THESIS QUESTION

Because TAF missions must be viewed in context this thesis poses the following question: How can Tactical Air Forces (TAF) best support the Operational Commander in his maneuver of large ground forces? This question addresses not will the Air Component Commander support the operational commander, but how can he best support him in a resource-limited mid-to-high intensity scenario?

This thesis will answer the research question in several steps. First, it will investigate the concept of the operational level of war. Second, the paper will discuss maneuver theory at the operational level of war. Maneuver theory, along with Clausewitzian principles, forms the basis for U.S. Army Doctrine as found in FM 100-5 Operations. After maneuver theory, the third step will be to discuss the operational maneuver of large ground forces in an area of operations. The various roles and missions of the TAF will then be discussed within the framework

of those operational maneuvers. A list of relevant operational maneuvers and TAF missions is in Figure 1.

Finally, as part of the analysis of the offensive and defensive operations, one case study will be analyzed in depth: the Soviet

OPERATIONAL MANEUVERS	TAF MISSIONS
<u>Offensive</u>	
Envelopment	Offensive Counterair
Turning Movement	Defensive Counterair
Penetration	Close Air Support
Frontal Attack	Battlefield Air
	Interdiction
<u>Defensive</u>	Air Interdiction
Retrograde	
Attack into a Salient	
Encirclement and Breakout	

Figure 1 OPERATIONAL MANEUVERS AND TAF MISSIONS CONTRASTED

counteroffensive at the Battle of Stalingrad. Other historical examples will be used as necessary.

THE CHANGING OPERATIONAL ENVIRONMENT

There can be little argument that the operational environment is changing. Military forces, from a technological point of view, are becoming more lethal. For example, a present-day armored task force (battalion equivalent) in the defense is expected to control as much as 18,000 acres, compared to the 400 acres controlled by World War II (WWII) counterparts. Today's battalions have ten times as much firepower as

those in WWII. Modern fighter bombers exceed the payloads of the heavy bombers of WWII. However, the ranges of the modern day fighter and the WWII medium bomber are not significantly different (using a hi-lo-hi profile).³ Modern air defense systems, properly employed, can now sanitize an area over a maneuver force that was only possible in WWII with fighter cover.

There is now the recognition that a war cannot be won by doing a single set-piece battle. Perhaps the best description of this can best be seen by looking at German Wehrmacht literature prior to WWII. During this period, changing technology (the tank and the aircraft) was causing military planners to rethink their vision of future war:

The picture of future battle therewith presents itself as a long-continued struggle, in the course of which the enemy resistance is broken down piece by piece, some small, some large--a struggle that wears out the adversary, but does not force him to his knees at one stroke. Victory and defeat will not be gained in a single battle, but in a series of battles and operations, perhaps only in a series of campaigns.⁴

Tactics and operations are also evolving. Modern military forces are now forced to operate in three dimensions (the air being the third). Modern commanders must be even more cognizant of the capabilities and limitations of all parts of their forces. Air Vice Marshal R.A. Mason has observed that one of the characteristics of this evolution is the 'convergence' of airpower on modern warfare. As warfare gets more complex, airpower and ground forces converge in four areas:

a. There is a blurring of the traditional distinction between "strategic" and "tactical" airpower. During the Vietnam War, both B-52's and TACAIR (tactical air power, usually composed of fighters) struck

strategic targets inside of North Vietnam. Israeli F-16's and F-15's have routinely accomplished strategic missions with strategic objectives.⁵

b. Ground forces can now greatly affect the air picture on the modern battlefield. In the Bekaa Valley in 1980 and the Sinai in 1973, the Israeli Defense Forces (IDF) ground forces contributed to the destruction of surface-to-air missiles, heretofore an air force mission.

c. More of the terminal portions of an aerial attack can now be relegated to 'intelligent' missiles versus manned platforms.

d. There is convergence in Western and Soviet attitudes and operational procedures.⁶

Unilaterally, each service has honed the elements of its own unique forces to a fine edge. Army forces emphasize combined arms on the battlefield with the integration of its battlefield operating systems: maneuver, fire support, mobility and countermobility engineer support, combat service support, air defense and intelligence. The Navy integrates combined arms by integrating strike, air, surface, and subsurface warfare specialties. The air force emphasizes the strengths of its combat power by "force packaging" for deep operations. This force package includes air superiority fighters, surface-to-air missile suppression (F-4G Wild Weasels), strike aircraft, and electronic countermeasures jamming support.

If the battlefield is fluid and non-linear, both air and ground power must interact better to be more responsive. Friendly forces will become commingled with the enemy. Units will be cut off. Soviet writers believe that the war will be unexpected, with "...a diffuse front line,

wherein violent offensive action, will be the means of military activity."⁷

Just as the battlefield will be non-linear and violent, so too is the air war above it:

The air war is one of pace, of high rate, and of intensity. What will take many hours, even days, on the ground to determine success or failure, in the air may be evident within the first minutes of the battle; certainly within the first few hours.⁸

The legacy of the 1980s is that the threat of nuclear war is now greatly reduced, at least on a global scale. While the threat to our shores seems to be reduced, the threats to us or our allies' interests around the world might be a reminder that future warfare will be expeditionary in nature. The strategic movement of large forces complicates the problem. A small amount of combat power in the early days of a strategic deployment exacerbates the need for the operational commander to integrate the combat power of all his components in order to win.

FRAMEWORK

If general principles are to be gleaned from a thesis of this type, then a general paradigm must be constructed. This paradigm will be nonspecific as to location and generic as to force structure. By looking at a general situation, general operational principles that apply across the spectrum of mid-to-high intensity conflict should develop.

While writing in the framework of U.S. military doctrine, the intent of this thesis is not to discuss or generalize about service-specific

doctrine or joint doctrine. The principles to be found should be appropriate regardless of the existence of a particular doctrine. The existence of doctrine, when written correctly, only makes the job institutionally easier to accomplish.

Additionally, this thesis will not discuss the specific tactical or technical employment of various weapons systems except in an operational war context. Nor will it investigate the command and control (C²) of the various TAF missions at the operational level, i.e. counterair, interdiction, close air support, etc. Most of the current literature already available deals with apportionment, allocation and execution of TAF missions and therefore, will not be dealt with in this forum.

This thesis is not meant to force a conclusion about whether an operational plan supports or does not support higher level strategic objectives. The paradigm assumes that the strategic center-of-gravity is synonymous with the destruction of the enemy's armed forces or the seizure of key terrain. In WWII, this was demonstrated in the strategic goal of unconditional surrender achieved principally through the destruction of the German armed forces.

DEFINITIONS

The strategic level of war is the level of heads of governments and chiefs of services. It is the level at which national interests and objectives are defined and then converted into strategic objectives. At this level, all the elements of national power are used: economic, political, and military.

From these strategic objectives, the national military strategy, missions, and force structure are developed and implemented. Additionally, national military strategy is intimately involved in the development, deployment and employment of military forces.⁹ The means of strategy are the results of major operations and campaigns. The ends sought are the military conditions for peace.¹⁰

It is important to realize that the strategic level to the United States might be, and almost always is, considerably different from the strategic level of other countries. The difference is in scope and capability. The Iran-Iraq war is a good example. Iraq, as it pursues its national strategic objectives, may conduct a raid into Iran that satisfies those objectives. The same operation for a western power, however, in support of higher strategic objectives might be only operational in nature. It is the objective of the activity, not the size of the force or even the nature of the activity itself, which determines the strategic level of the act.

Two possible ways of looking at strategy could be by categorizing strategy into a strategy of annihilation and a strategy of exhaustion. The historian, Hans Delbrück, showed that a strategy of annihilation presupposes an overwhelming superiority which allows the attacker to win a decisive victory, thus forcing the defeated to succumb to the will of the victor. In this situation, battle becomes the only means to the strategic end. Battle is actively sought, for only in battle can the annihilation of an army be achieved.¹¹ The aim of a strategy of

annihilation is "...a decisive victory in the field, and all its resources serve this one end."¹²

The strategy of exhaustion assumes that neither side has an overwhelming force. Neither side can achieve a decisive victory with its forces in being. Now victory is achieved by wearing the enemy out. Battles are fought. However, when they are fought, the benefits of engaging in battle must outweigh the disadvantages of losing it. Therefore, in the subsequent maneuver that develops, battle is only one way of achieving a victory.

...Battle plays a role both in the strategy of annihilation and that of [exhaustion],¹ but the difference is that in the former strategy it is the one means that outweighs all others and draws all others into itself, while in the strategy of [exhaustion] it is to be regarded as one means that can be chosen from among several.¹³

Hermann Foertsch believed that a strategy of exhaustion is only possible for nations that are militarily weak, but have great economic resources and large amounts of space. For a very limited time, a nation may choose a strategy of exhaustion if it hopes to have a "decisive addition to its strength." He goes on to say that such a strategy can only avoid a defeat, "...it can never hope for victory."¹⁴ Many might argue that this was exactly the strategy the Allies used in WWII: hold Germany across the English Channel until Allied strength was great enough to effect an invasion of continental Europe.

¹Delbrück's actual term was "attrition." "Exhaustion" has been used here for clarity.

A strategy of exhaustion has two opposite poles: maneuver and battle.¹⁵ An armed force maneuvers in order to find the conditions for battle which favor victory. When battle is required, the two forces fight to achieve a victory, again seeking to find favorable conditions within which to maneuver and fight another battle. The "battle" in both strategies is the same: a violent, abhorrent affair. The difference is in the objectives and how they are achieved.

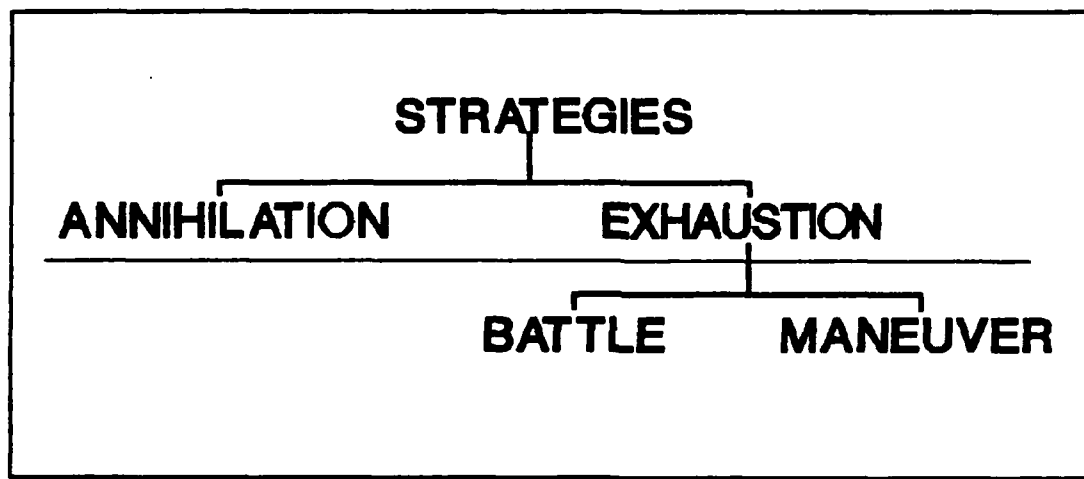


Figure 2 STRATEGIES OF ANNIHILATION AND EXHAUSTION

While the distinction between strategies of annihilation and exhaustion may not seem relevant, it does support any analysis centered around the operational level of war. It is important to understand this difference in order to focus on two specific theories related to battle: attrition theory and maneuver theory. (See the discussion in Chapter 2.)

The operational level of war is that level of warfighting that spans the continuum between strategy and tactics. Most often, this term is used to depict joint actions, plans and campaigns.¹⁶ It is at this level of war that campaigns and major operations are "planned, conducted, and

sustained to accomplish strategic objectives."¹⁷ To paraphrase a current airpower theorist, the questions of concern at the operational level are:

...what should be attacked to fulfill the purpose of the war, and from what platform--air, sea, space or land--can this be done with the greatest effectiveness, efficiency and prospects of success?¹⁸

Professors Allan R. Millett and Williamson Murray, in their work *Military Effectiveness*, state that the operational level of military activity is the "analysis, planning, preparation, and conduct of the various facets of a specific campaign." Inevitably, they say, these kinds of activities are the natural result of a nation's institutional concepts and doctrine. Operational activities include: marshalling of military units, selection of operational objectives, logistical support at the operational level, and the direction of the joint force made up of air, land and sea components.¹⁹

While most planners look at the operational level as an organizational characteristic, Richard Simpkin's definition of the operational level is divorced from organizational size. Simpkin believes that for a concept, plan, or warlike act to be considered "operational," it must meet the following criteria:

1. Have a mission lying at one remove...from a strategic aim;
2. Be a dynamic, closed-loop system, characterized by speed and appropriateness of response;
3. Consist of at least three components, one of which reflects the opponent's will;
4. Have an effect greater than the sum of its parts;

5. Be self-contained within the scope of its mission.²⁰

Another way to look at this level is by viewing the Central Region through the eyes of its NATO commander. General Hans-Henning Von Sandrart sees the operational level in the form of decisions that must be made. What are the dimensions of the Central Region? Will the force ratio at the critical moment be acceptable? What is the availability of reserves and the overall logistical situation? Can NATO go offensive, or should it stay defensive until there are enough reserves and logistics? How is Follow-on Forces Attack (FOFA) integrated into the land campaign?²¹

The means of the operational level of war are individual tactical actions. The ends are victories from major operations and campaigns.²² Campaigns are a series of related operations, sometimes composed of a series of battles, which together will achieve national objectives. Prime Minister Winston Churchill and President Franklin Roosevelt's WWII strategic goals were converted into a major operation, Overlord, which established the Allies' foothold on continental Europe.

You will enter the continent of Europe and, in conjunction with the other United Nations, undertake operations aimed at the heart of Germany and the destruction of her armed forces....After adequate channel ports have been secured, exploitation will be directed towards securing an area that will facilitate both ground and air operations against the enemy.²³

Campaigns and major operations do not always have to be "joint" in nature. A purely naval operation can be oriented at the operational level if that operation satisfies objectives which are only one step removed from national objectives. A naval campaign to secure Atlantic sea lines of communications (SLOCs) is an example of this.

On the airpower side, certainly the Royal Air Force's (RAF) role in the Battle of Britain is another example of a service unilaterally conducting a campaign. The national objective was to prevent a German invasion of the British Isles by securing air superiority over the English Channel. In this situation, a single service conducted a unilateral campaign to achieve a national objective.

Operational maneuver seeks to obtain a decision during the conduct of a campaign. U.S. Army doctrine, as embraced in FM 100-5 Operations, recognizes that battle and the planning for combat cannot just be restricted to the tactical level of war. It states that operational maneuver involves the anticipation of actions (both friendly and enemy) before the battle, the movement of large forces, and the sustainment of those forces, sometimes to great depths.²⁴ Operational maneuver includes: envelopments, turning movements, penetrations, and frontal attacks.

Another term used extensively in this thesis is that of operational commander. For this thesis, the operational commander is one who has command of air, sea, and land forces within a theater of operations. Under this assumption, therefore, a Unified Commander of a theater would be an operational commander because he commands air, sea and ground forces.

When the operational commander defines his mission in time and space he must find the operational center of gravity. This concept is critical to the development of a campaign plan. Clausewitz defined center of gravity as:

that characteristic, capability, or locality from which the force derives its freedom of action, physical strength, or will to fight....it is the hub of all power and movement, on which everything depends. That is the point against which all our energies should be directed.²⁵

Here Clausewitz used a term, the center of gravity, developed from an emerging scientific field in the 1800's, physics, and used it as a metaphor. He used it as a "focus and a framework for the application of military force."²⁶ He might just as well have used the terms 'weak link,' 'umbilical' or 'center of mass.' The term can be misinterpreted if not understood for what it is....a metaphor. Another description might be that point which, if attacked, might defeat or lead to the defeat of an enemy or help achieve a nation's strategic goals. In Napoleonic warfare, placing one's army between the enemy's center of gravity (it's army) and his capital, along his Lines of Communications (LOC) would ensure strategic success, sometimes without having to actually engage the enemy's army.

Conceptualizing the enemy's largest force as the center-of-gravity is both simple and provides clarity for an otherwise complex problem. This is especially true at the operational level.²⁷ In *On War*, Clausewitz further defined this operational level center-of-gravity.

A center-of-gravity is always found where the mass is concentrated most densely. It represents the most effective target for a blow; furthermore, the heaviest blow is that struck by the center-of-gravity.²⁸

Unmistakably, Clausewitz continues to emphasize that a commander can do no wrong by concentrating against the enemy's "fighting force" as a center-of-gravity.²⁹ This does not mean, however, that the operational

center-of-gravity is a weakness. To the contrary, once identified, the enemy center-of-gravity represents a concentration of enemy strength. It may not be, and probably is not, vulnerable to direct attack.³⁰

By the same token, it is probably unwise to think of the enemy as having only one decisive point, only one weakness.³¹ By attacking one weakness, the operational commander can now chip away at another weakness, until finally the enemy strength, its operational center-of-gravity, is unable to sustain itself operationally, logistically, or morally.

If you have identified the center-of-gravity correctly, your success will be decisive. If the enemy's center-of-gravity is not vulnerable to attack, the operational commander should take steps to neutralize it while throwing his center-of-gravity at an Achilles heel of the enemy--a weakness which is vulnerable, but yet leads to a decisive result.³²

Obviously, Clausewitz's context and experience were limited to the 19th century. He could not possibly have foreseen the future of aerial warfare. Because of its very nature, aerial warfare does not neatly fit the mold of many of Clausewitz's concepts. In land warfare, the defense is the stronger form of war. However, in aerial warfare, the offense is almost certainly the stronger form due to its ability to concentrate and maneuver in short periods of time over great distances.

For example, if an air force were tasked to remain on the defensive to defend a nation's capital, it would use up much more aviation assets in the defense than if the air commander were able to go on the offensive. This is true because of the flexibility and range of attacking aircraft. In a defensive mode, the air commander must protect all attack axes for 360 degrees (a spatial constraint) for 24 hours (a time constraint).

However, the attacker can pick and choose the time and axis of his attack. For the defender in particular, the situation is both manpower- and airframe-intensive.

In the offensive mode, however, the attacker can concentrate with fewer resources in lightly defended sectors to strike the enemy where his air forces are concentrated, his airfields. Now the initiative is with the attacker.

Operational Art is defined as:

the fundamental decisions about when and where to fight and whether to accept or decline battle. Its essence is the identification of the enemy's operational center-of-gravity--his source of strength or balance--and the concentration of superior combat power against that point to achieve a decisive success."³³

While this definition comes from an Army manual, FM 100-5 Operations, it nonetheless has direct utility on how an air commander runs his part of the war. This is art because there are no cut-and-dried answers. There are no templates to apply to a given situation that satisfactorily achieve the necessary end state: victory.

The tactical level of war is where battles and engagements occur. In the U.S. Army, this level is usually associated with corps and below. In air force operations, the individual combat between tactical aircraft and the packaging and employment of a fighter force for cross FLOT (Forward Line of Troops) operations is a tactical level activity. The means of the tactical level are the fighting forces. The ends at this level are tactical victories.

The tactical level of war is also the level of war in which the interplay of weapons occurs and individual combat is possible. Strategist Edward N. Luttwak refers to this as the technical level. For example, the firing of a TOW missile is at the technical level. But the employment of an Antitank Company armed with TOW missiles is at the tactical level.

By the same token, the one versus one (1 V 1) engagement of two fighters would be at the technical level, machine versus machine, pilot versus pilot. As the engagement expands in size, 4 V 4 and 4 V many, the air battle becomes tactical. However, the decision to launch aircraft into the battle is an operational activity based on commonly held principles of war. "Tactical level moves of particular units ...are merely subordinated parts of larger actions involving many units...the operational level."³⁴

Figure 3 graphically depicts the various levels of war and where they mesh organizationally within the Army and Air Force. In Figure 4, the same levels are portrayed differently to show the overlap of responsibilities and activities at the various organizational levels.

The blurring, or overlap, of the operational and tactical levels of war occur time and time again throughout this analysis. It is this blurring that creates unknowns, the proverbial fog and friction takes over. The great generals are the ones who can synthesize the two levels by use of operational art.

In a land war, operational art is exercised by applying combat forces at the right place and right time to defeat the enemy. It is achieved by operational tempo and sustainment.³⁵

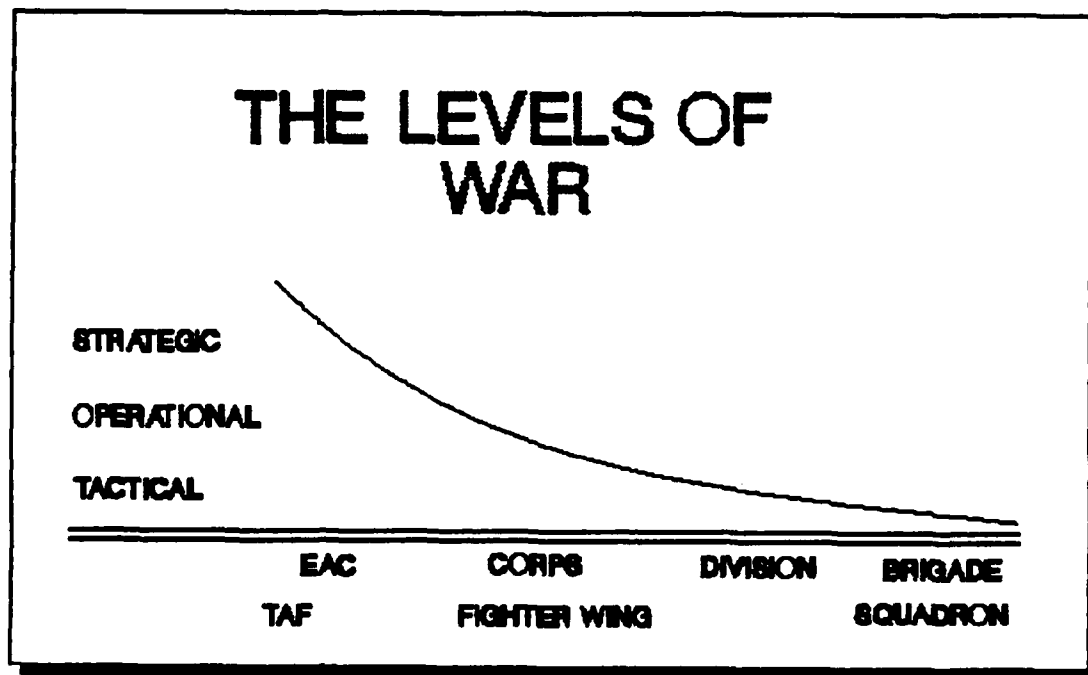


Figure 3 THE LEVELS OF WAR

In an air war, operational art is exercised by moving combat aircraft across the FLOT when and where the enemy least expects. It is the massing of fighters at the point of penetration of major enemy corridors into friendly territory. It is sortie generation and the sustainment of the air infrastructure: airfields, airborne early warning (AEW), POL, etc.³⁶

METHODOLOGY

The methodology used in this thesis is as follows:

Review maneuver theory.

Review air and land operations.

Analyze offensive operations using a conceptual paradigm and a historical case study of the Battle of Stalingrad.

Analyze defensive operations using a conceptual paradigm.

Conclude with possible lessons from the analysis.

A conceptual paradigm of war at the operational level is depicted in Figure 5 and Figure 6. Orders of Battle for Blue and Red forces are in Chapter 3. Note that the paradigm is conceptual in nature and is used only to illustrate the interaction of the ground and air power in a modern mid-high intensity conflict. Also note the absence of terrain on the map.

The central assumption of the conceptual paradigm is that the strategic objective is to defeat the enemy ground forces in the field. The defeat of those ground forces must occur at the operational level of

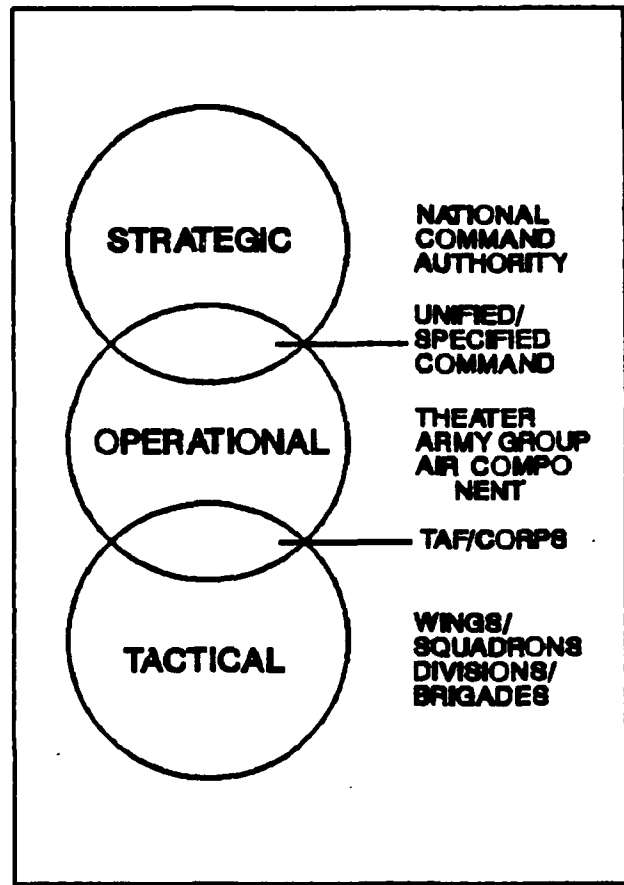


Figure 4 ANOTHER PERSPECTIVE: THE LEVELS OF WAR

war. Defeat is interpreted as either annihilation or surrender of those enemy forces. Hopefully, this thesis will contribute to the achievement of victory at the operational level.

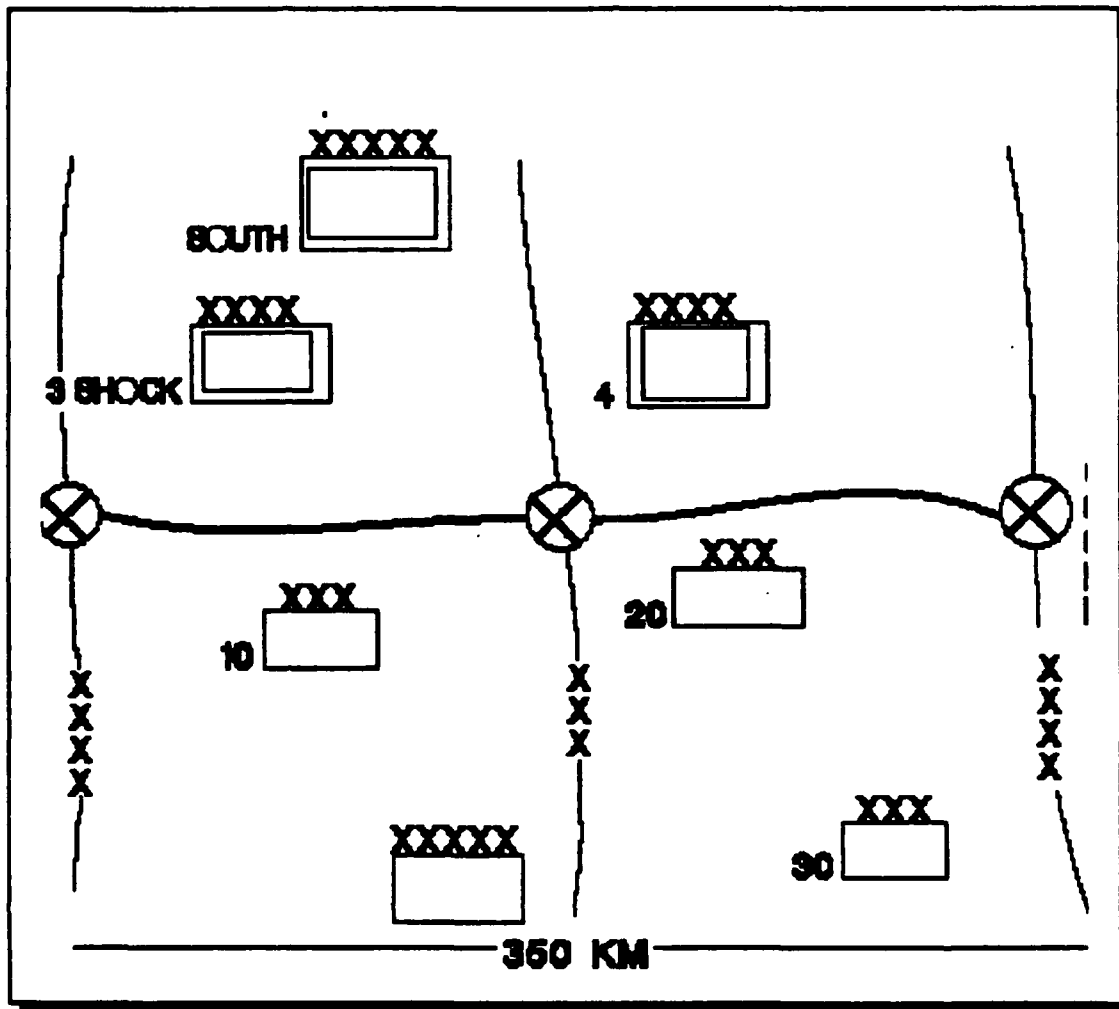


Figure 5 THE CONCEPTUAL PARADIGM

The paradigm also assumes a low probability of nuclear exchange. The use of tactical nuclear weapons on the battlefield might have such an effect as to radically change the nature of the war. The use of "tactical" nuclear weapons could have such far reaching consequences that their use would be "strategic." Their effect could only be speculated,

then, and not germane to discussion in this forum. Similarly, Rules of Engagement (ROE) will not be considered as an operational limitation. For example, cross-border operations, if they were a factor, would be authorized.

The paradigm also assumes a mid-to-high intensity conflict in which political implications at the national and strategic level are not considered. This further justifies the paradigm's operational goal of defeat of the enemy forces in the field. Therefore, the impact of coalition warfare at the operational level will not be considered.

STRATEGIC GOALS	PRESERVATION OF THE "STATUS QUO."
OPERATIONAL OBJECTIVES	DEFEAT OF THE RED FORCE ARMED FORCES IN THE FIELD.
ENEMY FORCES	ONE ARMY FRONT WITH ASSOCIATED SUPPORT.
TERRAIN	NOT A FACTOR FOR THIS PARADIGM.
USE OF NUCLEAR WEAPONS	NOT CONSIDERED IN THIS PARADIGM.

Figure 6 CONCEPTUAL PARADIGM ASSUMPTIONS

That is not to say that military options can be accomplished independent of the political ends defined by national authority. The military objective can only exist as the means to a political end.³⁷ In this paper, though, it is assumed that the military objective defined in the paradigm is the destruction or annihilation of the enemy force.

Assumptions about the enemy must also be considered. Even for the '90s, the West's opponents on the battlefield will most likely be Soviet-trained. The enemy operational commander would probably execute his

campaign plan within the framework of Soviet operational art. Both sides will have technological and material parity, i.e., basically the same quality of weaponry.

Using this paradigm, the gamut of maneuvers an operational commander might use will be compared and contrasted with TAF missions. For example, in an offensive situation, the commander might use envelopment, turning movement, penetration, and frontal attack. In a defensive situation, he might be forced to use retrograde operations, attack into a salient, or break out from an encirclement.

For each of the above situations, the thesis will evaluate the various TAF missions against those circumstances. These TAF missions are: offensive and defensive counterair (OCA and DCA), close air support (CAS), battlefield air interdiction (BAI), and finally, air interdiction (AI). Throughout this analysis, historical examples will be used to illustrate both successful and unsuccessful operations relevant to the point.

In order to properly evaluate the effect of airpower on a particular operational maneuver, the various degrees of air superiority must be used as a framework. John Warden, in his work *The Air Campaign*, had developed five CASES by which a planner can evaluate air support of operational maneuver.

Warden has broken out the various air superiority situations that are possible in a major operational campaign. They can be found in Figure 7. By comparing the vulnerability of friendly airbases against the vulnerability of the enemy forces, the planner can determine the best options for a supporting air superiority campaign. This analysis is

important because it graphically depicts a way of quantifying the air picture in an operational conflict.

Case I represents a situation where both sides' airfields are reachable and the FEBA is reachable. The NATO scenario is an excellent example of this case. Case II is defined by conditions where the friendly side's airfields are safe, yet the enemy's airfields and rear are vulnerable. This situation occurred in Southeast Asia (SEA).

The Case III scenario is the worst possible for the Blue, or the friendly, side. Blue's airfields are vulnerable, and Red's are safe. This was the situation during the Battle of Britain in 1940.

The Korean War is an example of the Case IV scenario. Chinese forces did not have the capability to strike U.S. and Korean airfields. At the same time the U.S. National Command Authority imposed restrictive rules of engagement and TACAIR could not fly into China.³⁸

The Case V scenario envisions two sides with very little capability to fight an air war. Inasmuch as the focus of this thesis is to explore how tactical air forces can be employed most effectively in support of the maneuver of large ground forces, CASE V has little relevance and is not discussed.

It is important to realize that regardless of the air superiority situation the friendly forces might be in today, the situation might be exactly the reverse tomorrow. For example, on Day One, the friendly air forces might be in a Case I situation, neither side has air superiority and both sides are vulnerable. By the end of the first week, the tide could shift to the Blue side. Now the conflict can be described as a Case

CASE	BLUE AIRFIELDS AND REAR AREA	BATTLE LINES	RED AIRFIELDS AND REAR AREA
I	VULNERABLE	REACHABLE	VULNERABLE
II	SAFE	REACHABLE	VULNERABLE
III	VULNERABLE	REACHABLE	SAFE
IV	SAFE	REACHABLE	SAFE
V	SAFE	UNREACHABLE	SAFE
Source: Warden: <i>The Air Campaign</i>			

Figure 7 AIR SUPERIORITY CASES

II scenario. However, because of an aggressive land operation which gained significant territory for enemy forces, friendly airfields might be lost. Now, the situation might be a Case III.

As a detailed analysis, the operational maneuvers of ground forces and TAF missions will be compared in detail using one case study from WWII: the Battle of Stalingrad. This campaign offers lessons as an operational level case study for several reasons. First, it involved large numbers of armored forces, moving over great distances using operational maneuvers. Second, those maneuvers resulted in large set piece battles. Third, the influence of tactical air power had a direct effect. Fourth, except for the 1973 Arab-Israeli War battles in the Sinai and the Golan Heights, there are few other examples since WWII of large scale operational maneuver with large armored forces and tactical air forces resulting in the achievement (or loss) of operational objectives.

In the absence of "real world simulation", the methodology selection has several advantages. History is a unique framework around which to draw theoretical concepts. In the absence of lessons drawn in blood from tomorrow's war, history lets one evaluate situations that have already been experienced. There are excellent examples available of the application of airpower at the operational level, i.e., WWII, Korea and the Arab-Israeli Wars.

Unfortunately, most quantitative results of war gaming and simulations are classified. This requires the reader to draw conclusions from history and to apply changing technologies and weapons systems against them. There is a possibility of error in drawing such conclusions. In fact, no greater mistake can be made than to assume that the same organization and tactics which won wars in WWII, Korea and the Middle East will survive tomorrow's mid-high intensity conflict. "Lessons" are best drawn from history when developed in their own context: time, place, and circumstances. However, conclusions and concepts drawn from the past help draw conclusions in today's context. If a strategist is going to think "operational" he must understand the interaction between air and land environments. In the next three chapters, the thesis will review maneuver theory, examine the operational commander's use of maneuver theory to achieve his objectives, and then evaluate how tactical air power can best support those maneuvers.

SIGNIFICANCE OF THE STUDY

This study will contribute to military art and science by making the reader more aware of TAF operations at the operational level of war. It will contribute to the concepts already developed by Col John Warden in his work, *The Air Campaign*.

For the Air Force reader, especially mid-level and senior air commanders, planners at the joint staff level, and participants in the Tactical Air Control System, the concepts in this study could have a significant impact on the way war at the operational level is visualized and fought. For the Army reader, especially at the Brigade staff level and higher, this thesis should provide an historical background and a better basis for an understanding of the proper application of air power during Corps and Army Group operational maneuvers.

By looking at airpower at the operational level, the reader will hopefully gain a "feel" for how air power affects operational maneuver in ground operations. By the same token, the effect that operational maneuver can have on air operations will also be investigated. Rather than looking at unit size or level of command, the reader will see how military actions between services are affected by each others actions, and how all of them support the primary activities of war: battles, operations, campaigns.³⁹

CHAPTER ONE ENDNOTES

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CHAPTER TWO

OPERATIONAL MANEUVER

OVERVIEW

The first section of this chapter discusses maneuver theory as the framework of mass and mobility at the operational level of war. In that context, maneuver as a component of ground power is described.

The operational commander can use maneuver theory, attrition theory, or a variant of both, as an integral part of his operational strategy. He selects his operational objectives, finds the enemy center-of-gravity, determines the threat and develops his campaign plan. In the second half of this chapter, the thesis will discuss how the operational commander integrates air and ground power to execute his campaign plan.

MANEUVER THEORY

There are certainly many ways of looking at warfare. One could concentrate on the separate mediums of warfare: the air, sea, and land. But to look at these mediums, in and of themselves, ignores the impact that operations in one medium have on the other. For example, a land campaign might be supported by both air forces as well as the air compo-

ment of sea forces. Conversely, a land campaign can greatly effect the ability of air power to be effective, as in the Israeli army's destruction of Egyptian fixed SAM sites in the 1973 Arab-Israeli War.

Chapter One addressed the division of warfare into three levels: strategic; operational; and tactical. Another way to look at warfare is by comparing the various means the armed forces use to achieve strategic ends. Those means are used within a framework of strategies already discussed in Chapter One: strategies of annihilation and strategies of exhaustion.

Elements of both strategies are significant factors in warfare at the operational level. At the operational level, warfare can be conducted as a "war by industrial methods." Or, warfare can be fought outnumbered by avoiding the enemy's strength and concentrating on his weaknesses. The first type is referred to as attrition theory; the second is maneuver theory. Figure 8 depicts the relationship between the strategies of annihilation and exhaustion and their corresponding theories of operational warfare. Note that maneuver/attrition theory fits into both types of strategies. In both cases at the tactical level, battle will eventually be fought, albeit for different reasons and objectives.

ATTRITION THEORY

To say that attrition theory is simply the Battle of the Somme all over again may be an oversimplification, but it drives home the idea that proponents of attrition theory believe victory will fall to the nation with the better production capacity, be it manpower or industrial. For whatever reason, large operational maneuver might not be available or

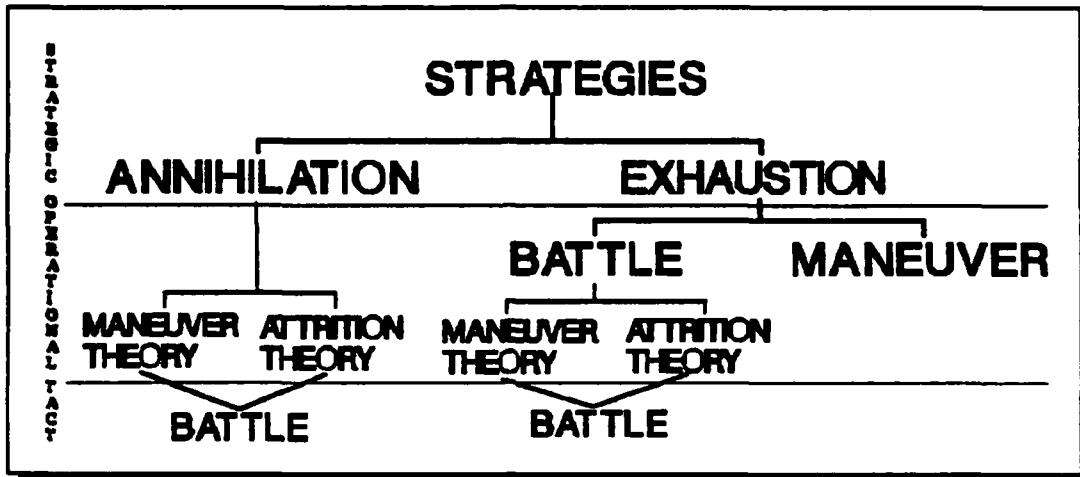


Figure 8 OPERATIONAL STRATEGIES CONTRASTED WITH MANEUVER THEORY

possible. The rear of the enemy and his lines of communications may not be open to attack, and therefore the battle of attrition is continued, with tremendous loss of lives and material, until one side sues for peace.

Twenty years before WWI, German General Colmar von der Goltz, wrote that, given balanced capabilities on either side, there could be only one result:

When the position of the defender is sufficiently occupied with troops, and the assailant is unable to operate against him on a larger front, it is impossible to see how this superiority is to be attained if troops and arms are of the same quality. There is only one means left...a larger supply of combatants...[emphasis added].¹

In this theory of war, the opponents simply try to gain an advantage in relative strengths. The winner will be the one who imposes on his enemy a higher "attrition rate" than he himself suffers.² To do this, the attacker seizes and holds ground, then once the relative strengths have shifted again in his favor, he goes back on the offensive. He advances cautiously on a broad front to seize more terrain until he either gains overwhelming strength (the Allies in WWII) or is completely exhausted (the Germans in WWI).³

Attrition is a war waged by industrial methods. The measure of success is the cumulative effect of superior firepower and material strength, eventually to destroy the full inventory of enemy targets...There can be no victory in this style of war without an overall superiority in attritional capacity, and there can be no cheap victories, in either casualties or material loss, relative to the enemy's strength.⁴

The fascinating aspect of attrition theory is that no "rational" nation has entered a conflict with the intent of using its young men as cannon fodder. In the case of WWI, certainly the German Army made an attempt at finding the tactical and doctrinal changes necessary to cause the penetration and influence the battle.⁵ What was prevalent in WWI is that competing industrial methods and technology tended to balance each other out until there was a reaction for every action. Consequently, a war by attrition could not be overcome.

On the Western Front, the train offered a technological solution to the operational massing of forces along the front. However, for all the speed and compression of distance the train offered, when the soldier detrained, his mobility was no better than had he walked from Berlin. Thus, when flanking movements were attempted, the foot soldiers were incapable of accomplishing the requisite march distances over a sustained period of time to make the maneuver successful.

Attrition theory, can be described in physical terms as the relative rates of change of mass with time (See Figure 9). That is to say, who can get to the Forward Edge of the Battle Area (FEBA)/Forward Line of Troops (FLOT) with the greatest force, measured by both maneuver strength (fighting battalions) and firepower.⁶

An airpower analogy closely aligned with attrition theory might be the Battle of Britain. In the late summer of 1940, Great Britain ef-

fectively conserved its strength until it won a war of attrition over the English Channel. Had the Luftwaffe attacked the British centers of gravity, the radar stations and the RAF airfields, the decision might have been entirely different. As it was, Goering chose to defeat the RAF in the air, a strategy which the Luftwaffe was neither technically nor tactically ready to accomplish.⁷

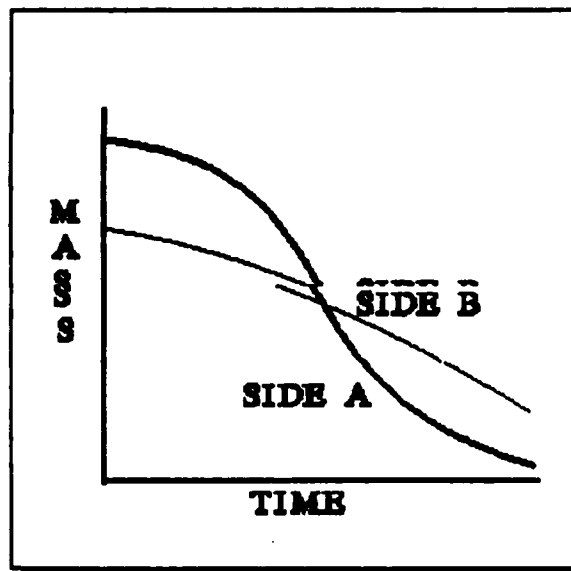


Figure 9 ATTRITION THEORY

In the next war, the initial days of the air war will probably be characterized as attrition warfare. No one will know the outcome until after the first sorties are flown. A 10% attrition rate will halve the force in less than three days. See Figure 10 for the losses experienced at various attrition rates over time. The loss will not be just in sortie rates for that day; it will be in losses of airframes and combat-ready pilots for the rest of the war, and the corresponding decrease in sortie generation that goes with those losses.⁸

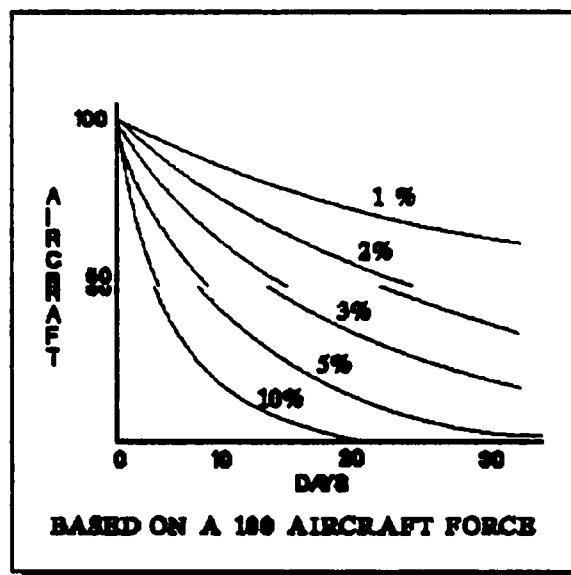


Figure 10 ATTRITION RATES

Some writers believe that the airpower battle of the next war will be won or lost in battles of attrition. The winning side will be the side with the most aircraft left.⁹ However, in order to fight and win with clearly outnumbered forces, attrition rates of 10% or more cannot be tolerated. The attitude of the Israeli Air Force (IAF) might be illustrative here. Out of sheer necessity, the loss of one fighter aircraft is tantamount to a national catastrophe. Therefore, the IAF actively seeks ways to avoid enemy strengths and gain the initiative to win. Maybe the solution will be found in the mutual integration of the air and land campaign. As Air Vice Marshall (AVM) R.A. Mason says: "A battle of attrition, either in the air or on the ground, does not seem an ideal Western option."¹⁰

MANEUVER THEORY

In maneuver theory, fighting is just one way to achieve a politico-economic aim.

True success lies in pre-emption, or in decision by initial surprise. Missions and objectives down through the levels are locally related to the strategic aim, and are concerned with enemy forces and resources.¹¹

However, unlike attrition theory, maneuver is used to strike where the enemy is weakest, rather than where he is strongest.

The proponents of maneuver theory have changed the literal intent of Clausewitzian "destruction of the enemy force" to something more subtle. Clausewitz said that the enemy force must be destroyed, an "annihilation of the enemy force." Maneuver proponents believe that the enemy force can be brought to a condition in which it can no longer continue the conflict by causing a significant change in conditions.¹²

Richard Simpkin, in *Race To The Swift*, has attempted to define maneuver theory by using the elements of physics as a metaphor. Maneuver theory has the elements of calculated risk, exploitation of circumstances, winning a battle of wills, speed, and response. It is a three dimensional system using the elements of mass, time, and space, as opposed to the elements of the bidimensional attrition theory: mass and time.¹³ In maneuver theory, the commander does not think in terms of filling gaps in a linear line. Rather, he thinks in terms of mass, leverage and tempo.

In order to avoid the tremendous cost in human lives found in attrition theory, the operational commander will try to find another way to cause the defeat of the enemy. He does this by using leverage. Leverage is created by having three separate elements, a base or holding force, a lever or mobile force, and an object or the enemy force.¹⁴ Another way of describing this is by using the "hammer and anvil" metaphor.

In Part A of Figure 11, the mobile force (M) has taken advantage of a penetration through the FLOT at point H_1 and is seeking to bypass the enemy's center of gravity (E). By bypassing the center of gravity at some point, the enemy will be forced to "turn" to face a new threat to his flank or rear. The point at which he must turn will occur no later than when the enemy's mass lies within the triangle formed by the two ends of the lever arm, $M-H_1$ and the other end of the line formed by the holding force, H_1-H_2 .¹⁵ This is depicted in part (b) in Figure 11.

The earliest that leverage will start to have an impact on the enemy will be as soon as the mass of the mobile force advances beyond a line parallel to the line of the holding force drawn through the enemy center-of-gravity. This is shown in part (c). The farther the mobile force

advances, the more leverage will be created, thus creating more conditions which the enemy must react to.

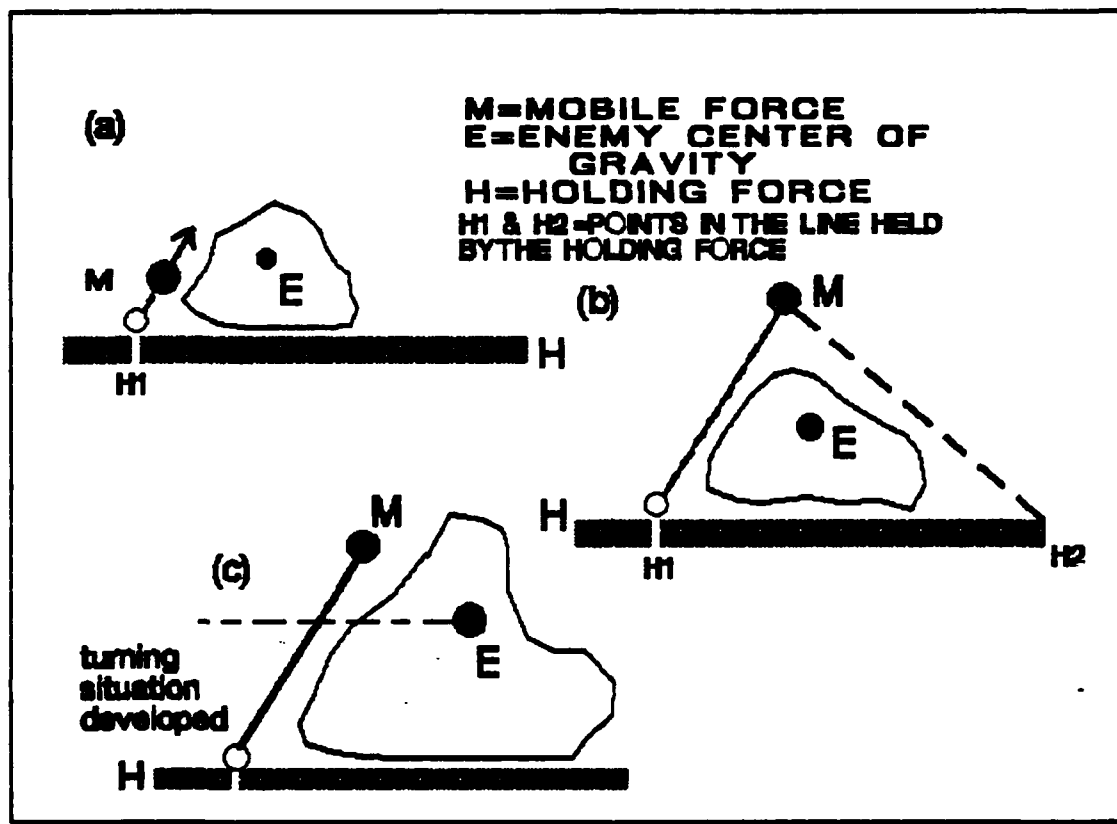


Figure 11 LEVERAGE AND MANEUVER THEORY

The insertion of the mobile force requires the "concealment of the design" or operational deception. The enemy must not perceive the direction of the thrust until it is too late for him to respond.¹⁶ In 1941, Soviet Army Colonel A.I. Starunin wrote that operational surprise was achieved by the "unexpected appearance" of a powerful force at a point so sensitive to the defender that he could not counterattack in time.¹⁷

The key to this operational leverage is the ability of the holding force (H) to maintain contact with the enemy. Maintaining contact forces the enemy commander to direct his attention toward his front, making his escape much more difficult. Now he cannot pull his forces from the PLOT

and direct them towards his flank or rear against the mobile force. Should the holding force not be able to maintain contact, then the mobile force must slow down or stop. This negates any advantage the mobile force had operationally.

The natural response of the enemy under this situation is to attempt a retrograde operation. When he does, the holding force must maintain contact by achieving a rate of movement at least twice the rate of the enemy's withdrawal. Correspondingly, the mobile force must increase its rate of movement, or tempo. For the mobile force to be successful, its rate of movement must be between:

two and three times that of the holding force. If the ratio is much over three, the lever arm may break simply through overstretch, and the hinge between holding force and mobile force becomes dangerously vulnerable to counterattack.¹⁸

This ratio of tempo between the elements of the maneuver system is extremely critical. Should the integrity binding the holding force and the mobile force be broken, either by the enemy's interference into the system, or by the operational commander's failure to "maintain," or sustain, the system, then the entire operation would result in a disaster.¹⁹

Clausewitz calls this failure to "maintain" the system the culminating point. The point at which the force euphemistically "runs out of steam." More realistically, it is the point at which the force runs out of POL, ammunition, food, or physical stamina. Now the advantage of leverage transfers to the opponent. Von Der Goltz called this characteristic the "waning power of the offensive."

In the course of the offensive...there is in each case a point of culmination, at which the original superiority has, through weakening influences, arrived at a condition which was still just sufficient for a victory, but which does not guarantee future success....Should the point of culmination arrive too soon...a disastrous reverse follows...²⁰

As mentioned previously, Simpkin calls the maintenance of the mobile and holding forces "tempo." By maintaining tempo, the enemy can be surprised and kept off balance. If a force has moral surprise, or complete strategic surprise, then it will probably be able to achieve an immediate decision. Examples are the Battle of France in 1940, and the destruction of the Soviet Air Force by the Luftwaffe in Operation Barbarossa.

On the other hand, material surprise "means that the enemy knows you are coming but cannot do anything to stop you." By creating conditions in which your tempo is greatly increased, you can achieve material surprise. This causes the enemy to react to your high-tempo operations--to try to restore the status quo. Moral surprise is not a prerequisite to victory at the operational level, and in most situations, moral surprise may not even be attainable. Soviet deep operations against the Germans in World War II, especially during the Vistula-Oder Campaign, provide good examples of material surprise.²¹

Unlike attrition theory, maneuver theory does not orient on terrain unless it is a physical resource for the enemy: a bridge, an airbase, or the terrain dominating that resource. Missions and objectives are all related to the strategic aim as opposed to attrition theory which held the ground "at all costs." The goal is to "incapacitate by systemic disruption--whether the 'system' is the command structure of the enemy's forces,

their mode of warfare and combat array...or even an actual technical system [emphasis added]."²²

Battles of attrition will be fought in a maneuver campaign. These attrition battles will occur at very key points: during the penetration of the mobile force, during the exploitation by the mobile force to gain tactical freedom of action, and during the application of the hammer-blow against the anvil.²³

During the penetration phase, attrition will be high as the operational commander seeks to find freedom of action around the area of the insertion. Even though the penetrating units will be only a small portion of the total force, the "fortune of the whole depends upon the success or failure of this fraction."²⁴

For the mobile force, attrition may become high during its drive to the operational depths. Multiple meeting engagements may occur as the mobile force deflects enemy counterattacks. The enemy will also try to "shape the penetration" so that the mobile force drives into a killing zone. The mobile force commander needs to deflect these enemy attempts so that he can reach far enough back in the rear to apply pressure to the anvil. The mobile force must maintain its operational freedom of action.

The last place that a battle of attrition will occur will be in the last phase of the envelopment as it begins to apply pressure against the enemy's main force. More likely than not, the enemy will finally realize that he is about to be surrounded and try to fight his way out of the pending encirclement. Given that the holding force is doing its job, and the tempo of the mobile force is great enough, the encircled enemy will be slow in reacting to this new threat. However, if the enemy makes an early

decision, he could overwhelm the mobile force from both directions by using massive meeting engagements in his attempt to breakout. These points will be further discussed in Chapter 3.

All of these meeting engagements will be particularly violent affairs:

"...at the actual points of contact, where the selected strength is finally applied, combat is quite likely to result in extreme attrition at the tactical level, even if combat with the enemy's main strength is successfully avoided at the operational level [emphasis added]."²⁵

To summarize then, no matter how much the operational commander might choose to avoid contact in order to achieve success, by either preemption or decisive surprise, fighting will inevitably occur. The slower moving force, the fulcrum in Simpkin's analogy will almost certainly be occupied with attrition warfare. The lever, the mobile force in the same analogy, will become engaged at other selected points.²⁶ The result is that the mobile force in the operational depth creates conditions out of all proportion in space and time to that preferred by attrition theorists. A simplified graphic of this total system is in Figure 12.

When considered in a framework of time, maneuver theory can best be described in hours, rather than days, weeks, or longer. The bypassed enemy is not just ignored, he is handled by the holding force. If the holding force executes this mission successfully, the bypassed force becomes, in effect, operationally irrelevant.²⁷

If the bypassed force is "irrelevant," the mobile force can now accelerate its tempo. The effects will be more profound. Suddenly, the time to execute the campaign becomes reduced by significant amounts.

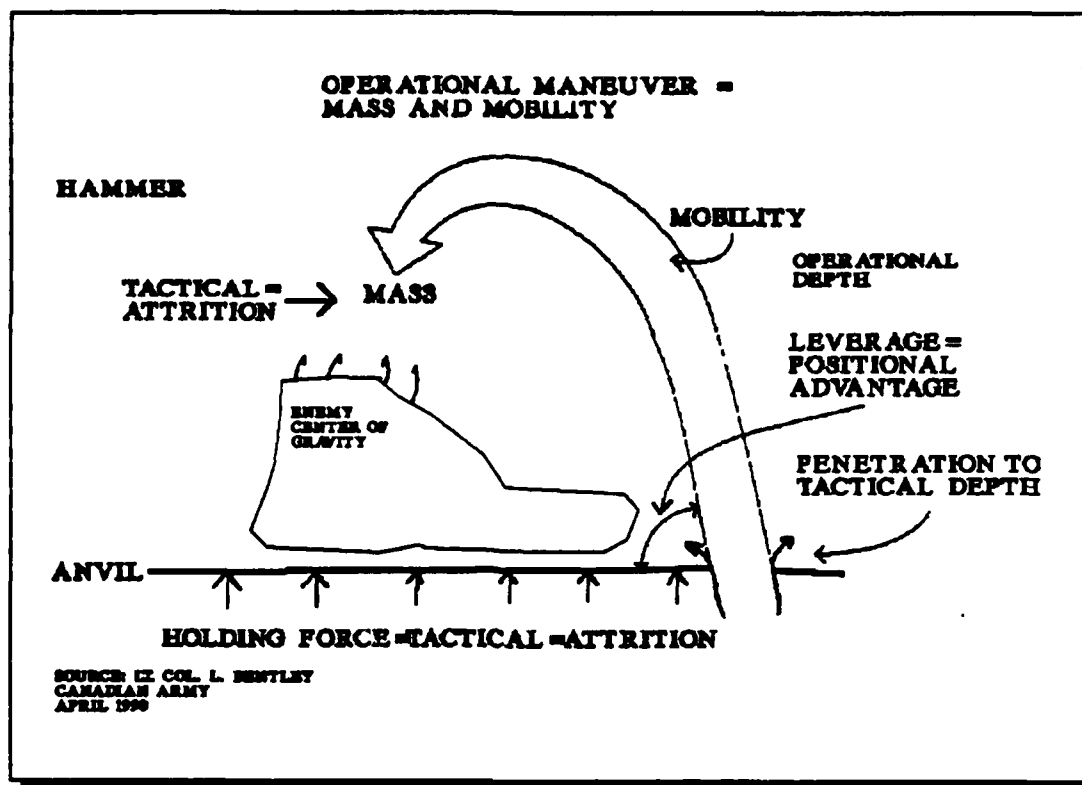


Figure 12 THE "SYSTEM" OF MANEUVER THEORY

In the Vistula-Oder campaign, the Soviets moved 600 kilometers in under two weeks using exactly this type of maneuver. Bypassed German forces, called "groupings," were ignored by the mobile forces while the holding force continued to maintain pressure as they retreated. Very few of the German forces made it back to German territory.²⁸

Firepower in maneuver theory is just as important as it was in attrition theory; however, firepower is now used far differently. In attrition warfare, movement serves firepower. In other words, a force moves to a better firing position in order to use firepower to destroy the enemy, to cause more attrition. In maneuver theory, forces are moved not just to achieve a better firing position, but also to create the "unexpected" for the enemy, to cause him to react to the presence of superior forces in space and time.²⁹ Firepower, therefore, helps the

mobile force to maneuver, which in turn causes a corresponding reaction by the enemy.

Central to any discussion of maneuver theory should be the avoidance of the enemy's strengths, his operational center-of-gravity. As discussed in Chapter One, the enemy's center-of-gravity is not his Achilles' Heel. However, the operational commander must correctly identify the enemy's center-of-gravity before he can determine where the weaknesses are. Those weaknesses may come in the form of decisive points; points which, if attacked, may cause the enemy's center of gravity to be defeated.

The operational commander will then concentrate his known strengths against those decisive points. His success will depend on the accuracy of his intelligence, his ability to achieve surprise, and the speed and precision of his actions.³⁰

Inherent in these concepts is the absolute need for operational intelligence by the commander. Without it, there may be no hope for success. Again, an example of this can be found in the Soviet Army's Vistula-Oder campaign in 1945. Because the Soviet Air Force had air superiority, the Luftwaffe was unable to perform basic battlefield reconnaissance missions. The Wehrmacht army group commanders were deprived, therefore, of operational intelligence. They could not concentrate their forces in time and space to defeat the Red Army's multiple penetrations. Once the penetrations occurred, the Wehrmacht could still not mass forces fast enough to counter the penetrations.³¹

The reverse occurred in the German Summer Campaign in 1942. Because the Luftwaffe had air superiority, it was able to conduct aerial reconnaissance at will. This gave the armored forces the information they

needed to bypass Soviet groupings, thus increasing their operational freedom of action and tempo.

There are two possible consequences to the employment of maneuver theory. The first possibility is that the results will be disproportional to the resources expended in the effort. The 1940 German offensive into France is an example of how an overwhelmingly decisive victory can be achieved with smaller forces using maneuver theory. Another example is the previously mentioned Soviet Vistula-Oder Campaign.

The second possible consequence of using maneuver theory, and certainly the more risky, is that the attack could fail if "the selective strength narrowly applied against presumed weakness cannot perform its own task or encounters unexpected strength."³² There are two possible reasons why an attack might fail. First, the intelligence system failed to correctly identify the enemy's weakness. That "weak" part of the line was not really so weak after all. Secondly, the force was not strong enough to accomplish its mission.

The Schweinfurt-Regensburg raids in WWII are good airpower examples of selective strengths misapplied against presumed weaknesses. While ball bearings were a vulnerability for the aircraft production for the *Luftwaffe*, the *Luftwaffe* was more effective than expected in defending the factories. The defensive formations the bombers flew were less effective than expected against *Luftwaffe* fighter aircraft. The strategic air forces faced setbacks and the Germans received the time they needed to disperse ball-bearing production until it was no longer a vulnerability.³³

Soviet operations in the winter of 1941-42, a period when the Soviets were on the strategic defensive, is another example of failed

attacks. During this period, Soviet forces were generally able to penetrate the enemy tactical zone and reach the operational depth. However, the Soviet echelonment and air superiority so prevalent in later years was not predominant at this time. Soviet success through the German lines could neither be reinforced nor predicted. The mobile forces were destroyed by local counterattacks, either from their rear, or laterally from uncommitted sectors of the front.³⁴

MANEUVER THEORY SUMMARIZED

The operational commander will use the principles of mass, concentration, and surprise in his operations. Should he decide to "go deep," he has now made a commitment to a different kind of war. His forces must be more mobile. His logistics must be more responsive, and the firepower for the holding and mobile force must be decisive.

He will seek to create leverage by applying mass at a critical time and place. He will seek to create tempo by structuring his mobile force for mobility and supplying it with the wherewithal to go to the operational depths. The mobility of this mass in the operational depths must be ensured by freedom of action on an operational scale.

He will focus on maneuvering his forces in relation to the enemy's force rather than focus strictly on capturing key terrain. At the operational level, he may still strive to take a road network or key terrain, but not simply because they are there. Rather, he will take them because they are critical assets the enemy needs to continue fighting. No one battle, in and of itself, is that important. Rather, it is the relationship of each battle to the overall objective that matters.³⁵

Maneuver theory presents the enemy with a sudden and unexpected change, or a series of changes, to which he is forced to adjust. It is this requirement for quick change which defeats the enemy, and usually at a very small price to the victor.³⁶

This section has reviewed both attrition theory and maneuver theory as it relates to warfare at the operational level. In Appendix II and III are short vignettes on the German Blitzkrieg and Soviet Deep Operation Theory. Both of these are generally regarded as the historical foundation for Maneuver Theory. The next section will discuss how the operational commander uses the elements of his air and land components to execute a campaign plan.

LAND AND AIR OPERATIONS

How does the Operational Commander plan to win a war against a massed Soviet style, armor heavy, or echeloned force? Given the consistency and scale of the Soviet effort, as well as their ability to maneuver mass, both on the ground and in the air, there may well be only one possible response when faced with an opponent who is a practitioner of Soviet style doctrine: the operational commander must be able to integrate his ground and airpower to have any hope of winning.³⁷

The operational commander must not only know his enemy, he must be satisfied with the knowledge that he can prevent the enemy from doing what he wants. "Swift and purposeful action" is the key to a psychological victory. An operational commander who finds himself in a state of constant agony worrying over what the enemy "might" do is far too prone to overreacting to an enemy force in the friendly rear, etc.³⁸

Figure 13 contains the tasks that the Operational Commander must accomplish in order to defeat a Soviet-style offensive.³⁹ The Operational

- * Break up the enemy air offensive
- * Launch offensive counterair operations to gain air superiority
- * Sustain air operations in the face of continuous waves of enemy breakthroughs
- * Disrupt, delay, and destroy enemy follow-on forces.
- * Carry out counterthrusts on the ground
- * Repel airborne and amphibious assaults
- * Provide a steady flow of resupply and reinforcement into the theater

Figure 13 OPERATIONAL TASKS

Commander must determine his overall operational strategy for the battle. He must establish priorities and create a broad scheme of maneuver to accomplish his aims.⁴⁰ He has limited resources. Therefore the use of those resources must be concentrated in a specific time and space.

An excellent example of the use of space and time in operational maneuver is General George Patton's attack into the Ardennes in December, 1944. In response to a *Wehrmacht* attack into the "Bulge," Patton's Third Army turned from an eastward orientation ninety degrees to the north. Patton moved three divisions and their associated combat service support units 100 miles in three days to counterattack against the southern side of the "Bulge."

Part of the operational commander's plan must also include phasing and culminating points so that the forces are sustained.⁴¹ Reserves are

essential. They reinforce offensive success, or, defensively, take the initiative away from an attacker.

At the tactical level, the main objectives are attrition, delay and destruction of reserves, C^2 , and logistics of the first echelon forces. The majority of artillery positions, tactical command facilities and forward assembly areas for the reserves are within 30 kilometers of the FLOT so that they can quickly influence the battle.⁴²

At the operational level, the commander emphasizes the disruption of enemy plans and the execution of his own. One goal of the operational battle must be to lessen the probability of prolonged military operations. Operations must:

1. Deny the enemy access to the objectives he seeks.
2. Prevent enemy forces from loading up the assault force fight with reinforcing echelons.
3. Find the opportunity and seize the initiative by maneuver to attack and destroy the integrity of the enemy operational scheme, forcing him to break off the attack or risk resounding defeat.⁴³

If the enemy is using blitzkrieg tactics, the defense must aggressively concentrate from the outset to destroy enemy assault echelons and slow down the follow on echelons. The Operational Commander accomplishes this with surprise, which, in turn, requires maneuver.⁴⁴

Surprise is the key. No attack in modern war is feasible or likely against an enemy in position unless his resisting power has been paralysed by some form of surprise. This surprise can be created either through operational maneuver (the leverage of maneuver theory), or by creating firepower, which can create tactical surprise.⁴⁵

There are four fundamental truths of surprise for the operational commander:

Surprise is not an end in itself. It cannot be effective on its own as it is a condition of success not success itself.

Surprise should primarily be directed at the mind of an enemy commander rather than at his forces. The aim should be to paralyze the commander's will.

Surprise need not be total.

The major factors in achieving surprise are intelligence, deception, secrecy and speed.⁴⁶

To achieve the desired effect in operational maneuver, Richard Simpkin believed that the enemy has to be "set up." The holding force commands the enemy's attention to his front. The mobile force then creates an effect on the enemy out of all proportion to its size by its application of leverage.⁴⁷

Holding forces, mobile forces, leverage, tempo; these are the concepts that an operational commander uses to defeat an enemy force. Possibly the airman, if he understands the "physics" of the problem, can use the characteristics of airpower (speed, range, and flexibility) to best support the operational commander.

If there is a single, most important concept that airmen should take from any discussion of the operational level of war it is the operational commander's concept of the "main effort." While it is related to the Bundeswehr's concept of *Schwerpunkt*, the concept recognizes that there are limited assets with which to fight a war. The limitation could be there because of peacetime budget constraints and force structure limitations. More likely, however, the limitation exists because of strategic deployment limitations: airlift and sealift can only carry so much in a limited span of time. Therefore, in order to concentrate mass, the operational commander designates his "main effort," not only to provide a focus to his warfighting battalions and squadrons, but also to give his

sustainment a priority of effort. By focusing his operational and logistics efforts, his own operational center-of-gravity is identified.

After identifying the enemy center-of-gravity, the operational commander must now decide how to employ those of his forces he has designated as his own "main effort." Each unit in the force must be assigned a mission. Those units that are not the main effort will be designated as "supporting."

He must avoid making an automatic decision that all his available services must participate equally (or conceivably at all), that one is a priori supreme and must be supported by the others, that all must be about the same business at the same time, or that an enemy action demands a reaction in kind.⁴⁸

The relationship between ground and airpower at the operational level is very similar to the fighting concepts of combined arms warfare for the U.S. Army. At the tactical level, tanks need infantry to defeat enemy crew-served antitank weapons, while the infantry needs tanks to defeat enemy tanks. Both systems (tank and infantry) use artillery to suppress enemy infantry and artillery so that the friendly forces have the tactical freedom of action to achieve their objective. At this level the interaction of these various systems is quite clear. Where the clarity starts to fall apart is with the appearance of an enemy air threat.

Friendly freedom of action disappears when enemy TACAIR and armed helicopters appear. The only way the friendly force can regain its freedom of action is with Air Defense Artillery (ADA) or friendly TACAIR to drive off the air threat. At this level, the ADA and TACAIR take away the enemy's freedom of action in the air at that point in time and space. Of course, the reverse situation can occur for the enemy. A simple model of this interaction is in Figure 14.

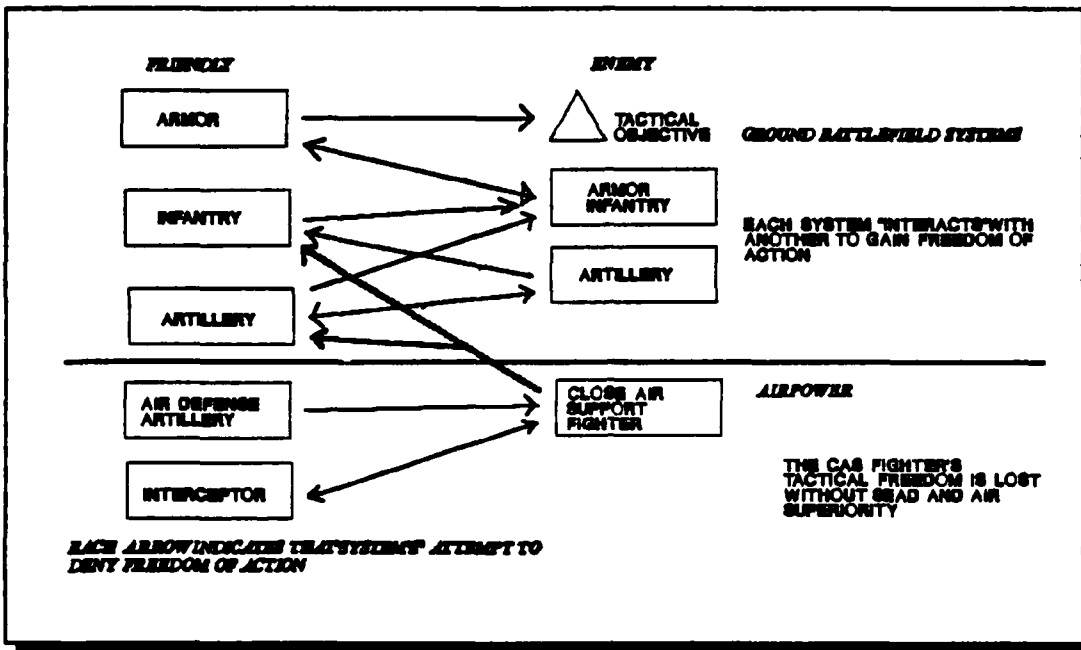


Figure 14 THE INTERACTION OF ARMY COMBINED ARMS

At the operational level the interaction is very similar. If there were no air forces, the two opposing armies would meet on the battlefield. They would use operational mass and mobility to maneuver to create conditions that the enemy must react to. If the enemy ground force's LOCs and sustainment can be disrupted or destroyed, then his ability to maneuver this large mass (tempo and momentum) would be affected. The enemy's freedom of action at the operational level would be disrupted or possibly stopped. Occasionally there would be battles at the tactical level. Eventually, there will be one or two final battles, the victor being the side who has best taken away the freedom of action of the enemy.

When air forces are inserted into the model, however, the scope of the operational level changes. U.S. Air Force doctrine has long stated that airpower offers characteristics to the operational commander that he can exploit in support of his main effort: speed, range, and flexibility. Speed affords the "rapid projection of combat power." Range gives the

ability to operate in any direction. Flexibility allows airpower to perform a variety of missions.

The speed, range, and flexibility of aerospace forces allow commanders to move quickly from one course of action to another and to influence military operations with extensive, fundamental combat capabilities.⁴⁹

It is these characteristics of airpower that the air commander uses in support of the operational commander. By necessity, the interaction of airpower with ground power must be cyclic. To understand this, an understanding of tactical freedom of action for TACAIR must be explained.

With complete freedom of action at the tactical level, a Close Air Support (CAS) fighter can provide unlimited support to friendly forces at the FLOT. However, he never has complete freedom. Enemy ADA must be suppressed and the enemy interceptors must be kept from the FLOT if that CAS fighter is to operate in a manner that best supports the ground forces. At this level, the CAS fighter must either have other fighter cover or the support of large Suppression of Enemy Air Defense (SEAD) activity to be successful.

The SEAD support can come from very limited air force assets. But realistically for the CAS fighter, his SEAD comes from the ground forces he supports: artillery, armed helicopters, and electronic warfare. Nevertheless, if the fighter is to provide close air support, he must have tactical freedom of action at the FLOT. Of the two problems preventing that, the more serious is that of air superiority.

Similarly, in the airpower tactical fight, the fighter versus fighter battle is fairly straight forward. Enemy ground ADA, however, tends to deny the tactical freedom of action for the friendly fighter.

This requires a corresponding action on the ground from ground maneuver forces as depicted in the next figure.

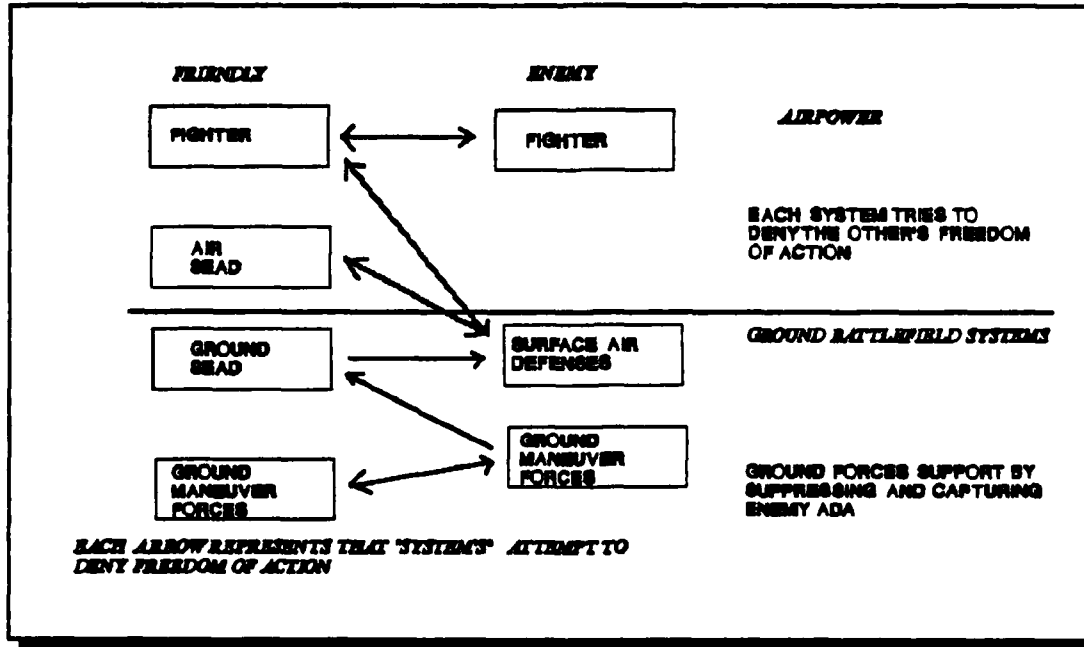


Figure 15 AIRPOWER AND FREEDOM OF ACTION

Thus we see that at the tactical level, both ground and air forces require actions by the other to achieve freedom of action. Neither component is entirely independent.

What is the relationship between the ground operational maneuver plan and the air operations plan? The air-minded will notice that so far, in a discussion of operational maneuver and maneuver theory, there has been very little discussion of TACAIR support. There is a reason for this:

The operational commander does not focus on the battle in this way. He needs to think in terms of manipulating an enemy--getting him overextended, tricking him into defending or attacking at a great disadvantage. The operational commander integrates the tasks...to control his opponent's actions and mind-set.⁵⁰ That control is the goal of the operational commander.

Therefore, the air commander must use the characteristics of airpower, speed, range, and flexibility, to support the operational commander.⁵¹ These characteristics are usually very difficult to achieve with ground forces.

The flexibility of airpower describes its ability to strike crucial targets "across the depth and breadth of the battlefield." Flexibility also denotes airpower's ability to switch roles, from air-to-air to air-to-ground in short order to influence both the air and the ground aspects of the battle.⁵² This characteristic implies the ability to tactically switch fighters from the air superiority roles to offensive air support of ground forces. To do this requires centralized control.⁵³

The range of airpower also contributes to its flexibility.⁵⁴ Its ability to perform missions at great distances from its bases offers the operational commander options that he would not otherwise be able to execute with his shorter ranged assets. "End runs" around a front, endurance in air-to-air combat, or endurance over a CAS/BAI engagement area are all examples of this.

In addition to allowing an operational commander to rapidly concentrate firepower, airpower also adds depth to the battlefield. In situations where there is little room to maneuver at the operational level, airpower can extend the battlefield in depth.⁵⁵ The German Army in 1942-44 had immense depth to work with on the Eastern Front. On the other hand, the Allies prior to the Normandy invasion in June, 1944 had none. It was strategic and tactical airpower which "created" an operational depth to the battlefield prior to the invasion.

When tactical air support does not have adequate range, the impact on ground operations can be significant. Airfields have to be built or repaired closer to the FLOT so that airpower can provide support. If the ground offensive has progressed so far that the fighters cannot reach the FLOT or the enemy's airfields, the ground offensive could come to a grinding halt. Manstein's counterstroke took advantage of the Soviet's lack of air support and cover when the Soviet army overextended themselves in February, 1942. The operational commander of the Soviet attacking force failed to provide adequate protection from either tactical air or AAA.

Airpower's inherent characteristics allow an operational commander to observe a principle of war in which may lie one of the most important keys to success on the modern battlefield: concentration. With outnumbered forces, concentration allows the "main effort" to provide numerical superiority in limited space and time to influence the battle. Concentrating combat power is the key that weights the main effort.⁵⁶

The effect of accurate firepower, concentrated in time and space will continue to be a devastating card to play in winning the land battle....the land commander should seek to manipulate the battle to concentrate the enemy in killing zones where the air and ground forces at his disposal will prove to be most effective.⁵⁷

High sortie rates greatly affect flexibility and concentration. The bottom line to any quantifiable measure of operational airpower is effective combat sorties.⁵⁸ An effective combat sortie must be one which can accomplish its assigned mission. A combat fighter which can be refueled and fixed but not rearmed will not be an effective combat sortie. By the same token, a fighter which cannot reach or attack its target

because of a large threat from the air or the ground would also not be considered an effective combat sortie.

Therefore, it is not enough to have a lot of aircraft, nor is it enough to be capable of generating vast numbers of sorties. The sorties must accomplish the mission for which they were assigned if they are to be effective at the operational and tactical levels.

There are numerous factors that affect the generation of effective combat power. Those factors are described in Figure 16.⁵⁹ See also Figure 10 for a depiction of how attrition rates affect combat strength over given time period.

High sortie rates create great strain on operational logistics and sustainment. Why? First, because high sortie rates presumes a 24 hour a day operation. Second, John Warden's ideas on air reserves aside, tactical air forces in the past have not generally been put into "reserve." High sortie rates require huge amounts of spare parts, POL, and the wherewithal for battle damage repair. Servicing (refueling and rearming) of diverted aircraft at sister airfields also must be accomplished.⁶⁰

The concentrated application of airpower offers perhaps the greatest potential advantage airpower brings to its support of maneuver theory. At the tactical level, a modern jet fighter may well have the equivalent firepower of at least an armored company combat team.⁶¹ In a specific time and place, airpower can offer a concentration of firepower to create a breakthrough, aid in the formation of leverage for the mobile force, and prevent enemy reserves from interfering with its action. However, and this is most important to consider for the operational commander and his

Base capacity	Number of aircraft which can be supported at maximum sortie rates, a fixed number.
Base status	A measure of the <u>condition</u> or availability of support equipment, supplies, facilities and personnel, factor varies between 0 and 1.0.
Logistics	POL, Class V, Class VII
Dispersal	The more dispersed (survivable) the unit is, the less sortie generation the unit can produce.
Rerole	The ability to <u>tactically</u> switch the roles of multirole fighters. When accomplished, sortie generation falls because of the maintenance required to reconfigure the aircraft.
Reconnaissance	A quantity of sorties able to provide information about a quantity of unknowns, including enemy airfield capacity, status, aircraft basing, troop locations, etc.
Time	Night or Day operations. The decisions to use combat sorties in one period usually means that those sorties will not be available in the other period. Sorties flown in one period will undergo repair and reconstitution in the next period.
Weather	Affects individual mission effectiveness, added up relates to operational effectiveness.
Special Support Missions	Defense suppression aircraft, electronic countermeasures aircraft, and air superiority fighters to escort a strike. Limited in number and requires "packaging."

Figure 16 PLANNING FACTORS OF AIRPOWER

staff, if air superiority is not available across the space of the operational maneuver, the air commander may not have the freedom of action necessary to concentrate in time and space. If the air commander does not have freedom of action, neither will the ground commander.

A unique quality of air power is that the concentration of force is not linear, as in a land battle. Since a tactical air mission can be attacked anywhere along its route, from its base to its target and back,

geography does not effect the characteristics of concentration. Therefore force ratios in air combat only matter at a specific time and place, at the point of contact. The 3:1 ratio does not work here, either.

The number of air defence fighters required to defend against a threat, suggests that while the numerical ratio may be debatable, the defender is nowhere near so favorably placed as he is in the land battle environment.⁶²

Airpower can achieve surprise by choosing the time and the specific concentration with which to attack. This makes the problems of the defense greatly exaggerated.

The defender must be prepared to defend at all points at all times if he is not to accept some targets undefended [sic]. This is a demanding task, which can soon exhaust resources unless they are tightly controlled. That is true of virtually all air defence situations, but solutions are highly dependent upon the geography of both defence and offense.⁶³

In contrast to the tasks of the Operational Commander discussed earlier on page 48, the tasks of the air commander in a theater war are no less important. They are:

Gain and retain air superiority in the theater.

Delay, disrupt, and destroy enemy follow-on forces prior to their entry into battle, to impede resupply efforts, and to generally disrupt the enemy's land campaign.

Assist army units directly during battles with enemy ground forces by supplying close air support--i.e., by destroying or disrupting enemy maneuver units and fire support elements engaged with, or in close proximity to, friendly troops.⁶⁴

Given the operational commander's guidance and priorities, the air commander must first consider the enemy center-of-gravity and his doctrine in order to develop a plan. However, the air and ground commanders are not always in agreement. "Powerful forces are pulling the ground commander one way and the air commander another."⁶⁵ Those "forces"

include lack of air parity at the FEBA, defending against the enemy's "main effort" without adequate CAS support, or a myriad of others.

Today, in a non-linear, fluid battlefield, agility will be at a premium.⁶⁶ The decisive point for airpower to affect the battle will probably not be related to a geographic reference. Rather, there will be a specific time and place where local air superiority will be required to support the "main effort," wherever that might be.⁶⁷

One example of airpower providing support in a limited space and time to support the "main effort" was the Normandy invasion. Air superiority over the beachhead was achieved through an intense strategic bombardment campaign over Germany and a detailed offensive counter air (OCA) campaign in Western France and the Benelux. The strategic campaign drove the Germans to withdraw a sizeable fighter force back to Germany to defend against the bombers. The OCA campaign controlled the Luftwaffe fighters that were left. This air superiority provided the freedom of action for the air commanders to delay and disrupt the Wehrmacht panzer armies as they tried to reinforce the Normandy defensive lines.⁶⁸

So how can TACAIR contribute most effectively to the operational commander's campaign plan? Earlier in this chapter the concept of tactical freedom of action was discussed for both the ground and air forces. When the objectives and characteristics of both are integrated at the operational level the concept of freedom of action still holds true. The operational commander must have the freedom of action in his operational rear to concentrate large ground forces so as to create situations that the enemy must respond to. So long as the enemy has

freedom of action at the FLOT and in the rear, the friendly forces will not be able to maneuver.

Similarly, when an air force is at parity or outnumbered by the enemy, history has shown that the best way to employ it is to go offensive--deep into the enemy's rear to deny the enemy air commander freedom of action in his own rear. To fail in this endeavor gives the enemy two benefits: first, the enemy gains freedom of action to strike ground forces; and secondly, friendly air is denied the ability to support its ground forces. Therefore, the operational mission of airpower must be to strike the enemy air infrastructure first, and secondly, to deny the enemy's operational forces the ability to move around the battlefield.

To accomplish its mission, ground power depends on airpower. However, airpower increasingly depends must also rely on the unique capabilities of ground power: the ability to seize and hold enemy airfields and other infrastructure, and highly concentrated SEAD to allow for the penetration of airpower through the FLOT. The two requirements can be meshed by alternating the "operational main effort."

Air Chief Marshall Sir John Slessor (RAF) once wrote that airpower should accentuate muddle. Air power will rarely prevent ground operations. The exception is if the application is in concert with a well organized ground campaign, compelling "the enemy to expend effort and to wrest from him the initiative."⁶⁹ However, he says, while airpower cannot prevent ground operations, it can certainly delay and disorganize enemy forces.

The Air Commander must, therefore, think in a different sort of way to support the operational scheme. For a land operation that is planned

to last only a short time, the Air Commander must think in terms of air operations to be conducted over a period of days, weeks, or months.⁷⁰

To bring air power's unique capabilities to bear effectively on a conflict, the air commander must help to mold the operational commander's scheme of attack and combat plan--to shape the operational art....The essential lesson for future air power is that the air commander must mold the theater grand tactics [maneuver scheme] so that his doctrine, tactics, and equipment can put the maximum muscle into it...⁷¹

To build an air campaign that makes the best use of his assets, the Air Commander integrates the various air missions of AI, BAI, CAS and OCA/DCA into a synchronized whole. These missions are further defined and discussed in Appendix V.

At the operational level, air forces generate sorties to win the counterair fight or more directly support the ground forces. The airpower equivalent of the mobile force's deep battle is the offensive counterair campaign. By going offensive and destroying the enemy's air infrastructure (his airfields, radars, POL facilities, etc.) the friendly air force deprives the enemy air commander of his freedom of action, not just at the front, but in his operational rear as well. Thus, not only does the OCA campaign deny the enemy's air freedom of action in the rear, but friendly air has now gained, by default, a certain measure of tactical freedom of action at the FLOT. The friendly air force's primary concern now is not enemy air, but rather SEAD and accomplishing its own tactical missions. Figure 17 is a rough model of this concept.

In an attempt to cross the heavily infested FLOT, every ADA weapon at the tactical level will work to prevent TACAIR from crossing. Since it is entirely possible that those SAMS can cause a debilitating attrition rate, it is incumbent on the operational commander to help create

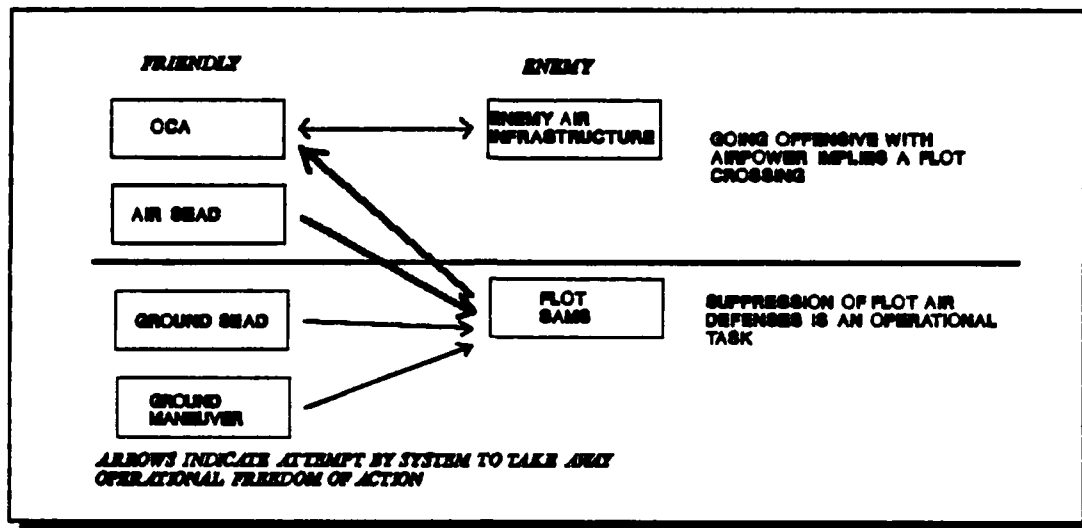


Figure 17 OPERATIONAL FREEDOM OF ACTION

conditions for TACAIR to cross the FLOT at critical points in time and space. A successful crossing now gives TACAIR's concentrated forces the freedom of action to operate at the operational depths, which in turn contributes to freedom of action in the operational maneuver.

During the fight for air superiority, the air component should become the "main effort" in the attempt to give the ground component freedom of action. As the air war is slowly won, the ground force should now become the operational "main effort". The air superiority campaign has given the ground commander "freedom of action." AI, BAI, and CAS can now be used to deny the enemy ground forces freedom of action.

In all cases, however, victory will most likely fall to the side who seizes the initiative early and maintains it to the end. "The key to seizing and retaining the initiative is to use manoeuvre to concentrate force at the critical point."⁷²

CHAPTER SUMMARY

In the first part of this chapter, maneuver theory was reviewed. This concept was discussed first because it is one way of analyzing the successful application of the operational art, both on the land and in the air. A discussion of the German Blitzkrieg and Soviet interwar Deep Operations Theory as historical foundations for maneuver theory can be found in Appendixes II and III.

In the second section, operational maneuver and the integration of air and ground power as they might be used by an operational commander was discussed. In the next two chapters, specific land maneuvers will be analyzed using an historical case study and a notional paradigm. Chapter 3 will discuss Offensive Operations while Chapter Four will discuss Defensive Operations. The focus for the next two chapters will be on integrating and synchronizing the air and land battle.

CHAPTER TWO ENDNOTES

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CHAPTER THREE

OFFENSIVE OPERATIONS

OVERVIEW

In this chapter, offensive operational maneuver and tactical air missions will be compared and contrasted at the operational level of war. Each operational ground maneuver will be presented in the form of a conceptual paradigm. Then each tactical air mission will be compared and contrasted against that maneuver using, using as a conceptual framework, Warden's air superiority cases discussed in Chapter 2 (See Figure 7.)

The center-of-gravity is a central concept for the operational commander. He must determine where the enemy's operational center-of-gravity is. He avoids it to avoid an attrition battle where possible. He then uses his own center-of-gravity, his "main effort," to strike at decisive points around the enemy's center of gravity. Clausewitz said that the enemy's center-of-gravity is the mass, the main effort, of his ground force. If this is so, then air power, because it can give or deny freedom of action to both the air commander and the ground commander, may well be a decisive point in the Jominian sense.

There will also be times when the air forces are completely independent in their operational concept and execution, such as in an air

superiority campaign: a TACAIR versus TACAIR scenario. In these cases, the Clausewitz' center-of-gravity may well be the enemy aircraft, but the decisive points in the air war will probably prove to be the enemy's air infrastructure. At other times, airpower must be completely interwoven into the ground scheme of maneuver, particularly during deep penetrations and envelopments. That interaction in offensive operations will be the focus of this chapter.

Regardless of the situation, whether air or ground forces have the operational main effort, good arguments can be made that the airspace over or contiguous to a military operation will be a decisive point.¹ Ground forces will attack to achieve significant objectives. The opposing ground forces will need help from their own TACAIR to defeat the enemy's TACAIR, and to provide additional firepower support to destroy enemy ground forces. The opposing air forces will fight to control the skies over the FLOT, while the opposing ground forces will seek ways to maneuver underneath the aerial onslaught. Under these conditions, victory will most likely fall to the air and ground forces that can best work together to achieve common objectives.

As an introduction to offensive operations at the operational level, this chapter will first review the Russian campaign at Stalingrad from the summer of 1942 to February, 1943, with particular emphasis on the Soviet counteroffensive after November 19, 1942. The Battle of Stalingrad is the beginning of the Soviets' Second Phase of the Great Patriotic War (WWII). Stalingrad was their first operational victory. The Battle for Stalingrad was a campaign in which the ground and air force ratios were almost even, yet the Soviets achieved a successful double envelopment.

The victory also came at a time when the Soviets were on the strategic defensive, having suffered massive losses against the German Blitzkrieg. It was the first campaign after the Soviets had converted their army and air force structurally and doctrinally to one capable of deep operations.²

THE STALINGRAD CAMPAIGN

SOVIET OBJECTIVES

In the defensive battle immediately prior to November 19, 1942, the Soviet objective was to stop the advancing Germans and make conditions favorable for a counteroffensive that would destroy the German forces around Stalingrad.³ The objectives of the counteroffensive were to encircle the enemy, hold back relief attempts, and destroy the German forces in the pocket.⁴

The Soviet plan at Stalingrad was also simple:

Strong forces would smash through the Rumanian-held flanks of Army Group B, trapping the German units of 6th and 4th Panzer Army in the narrow area between the Volga River and the Don Bend.⁵

The initial assaults would penetrate enemy defenses on both sides. The mobile groups would pass through to exploit the breakthrough. When the pincers linked up, the interior lines were to destroy the encircled Germans. The outer ring would repel any counterattacks from outside the pocket.⁶ (See Figure 18)

The Soviets created an elaborate deception plan to support their operational maneuver. Troop units moved primarily at night. The positioning of reserves was made to appear like defensive adjustments. The Soviet armies near Leningrad, Moscow and the Caucasus launched feints and

demonstrations to pin down German reserves. Their intent was to deceive the Germans as to the point of the main attack. The Germans were completely surprised by the concentration of forces around Stalingrad.⁷

GERMAN OBJECTIVES

The Germans generally agreed on their strategic objectives early in the war. They had to trap and destroy the Soviet forces to prevent a strategic retreat similar to that of Tsar Alexander I against Napoleon. The Generals wanted to take Moscow, but Hitler needed the Ukraine and the Caucasus for food and oil. This conflict caused armored forces to be diverted from the operational main effort towards Moscow and sent south to Kiev. The Moscow campaign got bogged down in the Russian winter, a winter the Germans were not ready for.⁸

The German operational objectives for Operation Blue, the drive to the Caucasus, became fixed. The objectives were to "destroy Soviet forces west of the Don, this time executed by smaller enveloping movements than in 1941, and to occupy Soviet oil-producing areas in the Caucasus."⁹

The results of Operation Blue could not match the German objectives. The southern offensive did not secure the Volga River, nor did it take the oil fields in the Caucasus. The Red Army was not destroyed, and the Germans were overextended without sufficient reserves to continue an offensive.¹⁰

SOVIET GROUND ORDER OF BATTLE

By reinforcing the attack forces at Stalingrad from the STAVKA reserve, 25% of the entire Russian infantry and air and 60% of the tank and mechanized units of the Soviet Army were concentrated around Stalingrad. Nine tank and six mechanized corps were used by the Soviets in this battle.¹¹

The Southwestern Front had two CAA (Combined Arms Armies), one tank army (totaling 18 rifle divisions), three tank corps, eight regiments of artillery and one air army (AA). The Don Front, attacking southward, had one air army, three CAA (totaling 24 rifle divisions), one tank corps, and 52 artillery and mortar regiments. The Stalingrad Front had one air army, five CAA of 24 rifled divisions, one tank corps, one mechanized corps and 67 artillery and mortar regiments. This front was to break through the defense of the Rumanian 4th Army, join up with the Southwestern Front and complete the outer ring of encirclement.¹²

To achieve even a marginal superiority in the breakthrough sectors, the Front and Army commanders reorganized by weakening secondary sectors and massing their men and equipment for the breakthrough. With the use of the STAVKA reserves, the force ratios in the breakthrough sectors were 2:1 in men and almost 5:1 in tanks and artillery.¹³

SOVIET AIR ORDER OF BATTLE

The 8th, 16th, and 17th Air Armies were attached to the Stalingrad, Don, and Southwestern Fronts, respectively. The Soviet air order of battle included thirty-two fighter, bomber, ground-attack, and "mixed" air divisions. A Soviet air division was subordinate to the air army and

consisted of three or four regiments. Each regiment had approximately 32 aircraft by February, 1943.¹⁴

During the summer of 1942, the Soviet army was executing retrograde operations. The air was owned by the Luftwaffe. Of all the sorties flown by the Soviet Air Force (VVS), 60-70% of them had engagements with the Luftwaffe. During some of this period, the VVS only had a 30-40% in-commission rate.¹⁵

From August to October, the sorties rates flown by both sides were as depicted in Figure 19.¹⁶ In September, the VVS had only 270 aircraft in commission: 80 fighters, 85 combat support, 54 day bombers, and 51 night bombers.

	<u>Soviet</u>	<u>German</u>
August	10,590	20,600
September	14,080*	18,200
October	14,747*	26,000
* Soviet night sorties: Sept. 6,692; Oct. 10,505		

Figure 19 SORTIE RATES, AUG-OCT, 1942

Figure 20 depicts the Air Order of Battle (AOB) for the counteroffensive on November 19.¹⁷ Bases of the 17th and 16th Air Armies were moved closer to the front lines. The 8th Air Army was moved within 100 kilometers of the breakthrough area.¹⁸

GERMAN GROUND ORDER OF BATTLE

The German ground order of battle at Stalingrad is in Figure 21. Note the large amount of allied units stationed around Stalingrad.

<u>Air Armies</u>	<u># of Aircraft</u>					
	Ptr	CS	BMB	Night	Recon	Total
16th	114	105		93	3	315
8th	284	273	65	122	7	751
17th	<u>82</u>	<u>40</u>	<u> </u>	<u>79</u>	<u> </u>	<u>201</u>
Total	480	418	65	294	10	1,267

Legend: CS (Combat Support), BMB (Bombers), Night (Night Bombers), Recon (Reconnaissance)

Note: Not In Commission Rate was 25%.

Figure 20 SOVIET AIR ORDER OF BATTLE, 19 NOV 1942

<u>FORMATIONS</u>		<u>CORPS</u>	INF	PZ	<u>DIV MOT</u>	TOTAL
Eighth	Italian	3	7*			7.5
	Army					
3rd	Rumanian Army	4	9**			11.0
6th	Army	4	11	3	2	17.0
4th	Panzer Army	1	2		1	3.0
4th	Rumanian Army	2	5			7.0
XXXXVIII	Panzer	1	1	2#		3.5
	Corps (Re- serve)					

* Two German, Five Italian
 **One German, Eight Rumanian
 # One German, One Rumanian
 Total includes separate brigades. Each brigade counts as 1/2 Div.
 Source: T.N. Dupuy and Paul Martell, *Great Battles on the Eastern Front*, p.71.

Figure 21 GERMAN GOB

LUFTWAFFE ORDER OF BATTLE

The Luftwaffe had 800-1000 aircraft during the summer and fall of 1942. This gave them a 2 or 3-1 force ratio over the Soviet Air Force during this period. The Luftwaffe's 4th Air Fleet was equipped with 1000

aircraft: 550 bombers, 350 fighter planes and 100 reconnaissance planes. However, during October and November the air force ratios began to swing back to the Soviets' favor. Unlike June, 1941, when the Eastern Front received 60% of the available airpower, the Allied strategic bombing campaign, and tactical air pressure in Italy and North Africa drew down Luftwaffe forces.¹⁹ By November the relative force ratio for the battle was about 1:1.²⁰

CHRONOLOGY

The German main offensive began on June 28, 1942. General Semën K. Timoshenko's front quickly collapsed on the Don River. Instead of following up their success, the Germans diverted armor south to support a drive to the Caucasus. By the time the armor was available for a final drive on Stalingrad, the Russians were dug in--in very difficult and defensible urban terrain. Further south, in spite of the diversion of armor to that sector, the drive to the Caucasus ran out of steam due to terrain, Soviet resistance, and a lack of fuel and reinforcements.²¹

After the German penetration near Kharkov, Stalin allowed his forces to retreat, preventing further German envelopments. By September 4, the German Sixth and Fourth Panzer Armies surrounded most of Stalingrad from the west. On September 19, the Germans broke through to the city itself. The Germans had reached their culminating point and a two and a half month battle began.

The intensity of the fighting could be deduced from the ammunition consumed, which for the month of September amounted to 25 million rounds of rifle and machine gun ammunition, a half-million antitank rounds, and three-quarters of a million artillery rounds of all calibers.²²

During this period the Soviet VVS was so devastated it could not respond adequately, even when the Germans started their river crossing operations on the Don River. They could provide only a limited response with CAS and BAI sorties targeted against German penetrations. However, even the freedom of action of these sorties at the front was contested in the 20-25 air-to-air battles the Soviet pilots faced everyday. Some engagements over the front were as large as 50 aircraft from both sides.²³

On October 1, the 8th and 16th AA had 373 planes in commission against 850 German planes (fighters: 71 to 350). The Germans had "complete control of the air" but the Soviets were not capable of responding with an aggressive counterair campaign. During this period, Soviet fighters were dedicated to ground support. They could not provide cover for the bombers and combat support aircraft that flew across the FLOT; nor could the VVS concentrate its buildup of airpower around Stalingrad. In Figure 22 is the breakout by mission of Soviet sorties during September and October.²⁴

<u>Missions</u>	<u>Number of Sorties</u>	
	<u>September</u>	<u>October</u>
CAS	9,036	11,032
OCA	280	483
AI	91	217
Escort (DCA)	3,282	1,441
DCA (FEBA)	2,698	1,529
Intercepts (DCA)	642	556
Reconnaissance	1,501	1,291
Airlift	47	282
<u>Total</u>	<u>17,577</u>	<u>16,831</u>

Figure 22 SOVIET SORTIES: SEPTEMBER AND OCTOBER

As November approached, Soviet forces in Stalingrad tied down the 6th Army on the front and immediate flanks. At the operational level, the Don Front had become a holding force. The pauses between German operations became longer. German operations were "carried out in short convulsive jerks lasting two or three days."²⁵

In preparation for the attack, not only were the Air Armies brought forward, but an extensive airfield network was created as part of a deception plan. In the 8th Air Army sector, 19 false airfields were built in addition to the 25 real ones.²⁶

Gradually, the Luftwaffe allowed its air superiority at Stalingrad to slip away. Why? The month before, the German Air Staff was so confident that Stalingrad would fall, it allowed fighter units redeployed north to the Moscow and Leningrad fronts. When the attack finally came, only 200 airlift aircraft were moved back to the German Don Front to offset the Soviet counterattack.²⁷

On November 19, 1942, the Red Army seized the initiative. In the Southwestern Front the encirclement force was the 5th Tank Army and the

4th Tank Corps, and the Stalingrad Front's strike grouping was the 13th and 4th Mechanized Corps.²⁸ Tank and mechanized corps quickly penetrated to the tactical depths. In the breakthrough, the corps advanced 30-35 kilometers, and sometimes reached 60-70 kilometers.²⁹ In the first 5 days of the attack, mobile units averaged 30 to 35 kilometers/day.³⁰

VVS sorties in the first days were evenly split between CAS/BAI and OCA/DCA: 43% for CAS/BAI and nearly 43% was used in air superiority missions against the *Luftwaffe*.³¹ However, during the encirclement phase, the weather was so bad the VVS was able to provide only very limited support to the ground operations. Between November 19 and November 23, the VVS flew only 369 sorties at Stalingrad.³²

The *Luftwaffe* was also grounded for the weather. However, by the fifth day of the operation, something even more significant for the *Luftwaffe* and the 6th Army had occurred. The Soviets had advanced far enough to take some key airfields. The *Luftwaffe* had to move aircraft from airfields around Stalingrad to Morozovskii and Tatsinskaia, 200 and 240 kilometers west of the battlefield.³³ Tatsinskaia was equipped for 600 aircraft while Morozovskii could handle 400.³⁴ This move tremendously increased the difficulty of providing essential airlift for the 6th Army.

On November 24, the encirclement was closed trapping the German 6th Army with twenty German and two Rumanian divisions in the vicinities of Kalachi and Svetskiy.³⁵ The exploitation phase was now fully under way. After the encirclement, 2,500 of 3,669 (68%) Soviet sorties were allocated to CAS/BAI missions.³⁶ On this day the weather began to improve also.

The Soviets were surprised by the size of the force they had encircled. The encircling ring was much larger than they had planned. At

the beginning of the encirclement the pocket was 60 kilometers long by 40 kilometers wide at its broadest points. Inside this pocket was nearly 300,000 men.³⁷

Most of the armored forces held the inner ring, while the smaller forces, the infantry and cavalry divisions, went to the Chir River and the steppe country to the south to hold the outer perimeter. Inside the inner ring was 70% of the ground forces, the outer ring had 30% of the forces.³⁸

The Soviets quickly realized they needed to adjust their forces around the pocket. The Soviets shifted their main effort to the outer ring, an action that was necessary because the Germans had started aggressive operations to rescue the 6th Army with the XXXXVIII Panzer Corps. This delayed the destruction of the 6th Army by the Soviet inner ring. With the reshuffle, 60% of the Soviet ground force was now on the outer perimeter.³⁹

Around November 26-27, the Luftwaffe started to conduct aerial resupply of the Stalingrad pocket. By December 19, the Luftwaffe was flying 250-300 airlift sorties a day. These sorties were flown into the two useable airfields in the Stalingrad pocket: Pitominik and Bassargino. Inside the pocket, two Luftwaffe fighter squadrons were stationed to defend the airlift effort. Unfortunately for the 6th Army, the Luftwaffe did not have the capability to fly the necessary tonnage. Nor did the two fighter squadrons have enough force to defend the pocket from the inside. It was a hopeless mission from the beginning.⁴⁰

On December 1, the 8th and 16th AA, stationed at airfields 30-50 kilometers from the front, started operations against the Luftwaffe airlift.⁴¹ The 16th AA flew 4,125 sorties in December. Only 326 (8%)

were CAS/BAI, while the remainder were DCA/OCA. OCA sorties against German airfields totaled 1,021.⁴² In addition, Soviet AAA barriers were built in a band four to six kilometers outside of the pocket.⁴³ Prior to the defeat of the 6th Army, then, the VVS was concentrating on those decisive points, airfields and the airlift, which would deny German freedom of maneuver inside the pocket.

Our systematic aviation attacks against airdromes and blocking airdromes by day and by night [sic] created conditions under which enemy airplanes in the ring of encirclement suffered heavier losses than those on the approach to it.⁴⁴

It took a month for the Germans to organize a response to the counterattack. By now, German Army Group Don was composed of the Italian 8th Army, the remnants of the Rumanian 3rd and 4th Armies, and elements of 4th Panzer army.⁴⁵ On December 12, XXXXVIII Panzer Corps counterattacked from Kotelnikovo towards Stalingrad. They drove halfway to Stalingrad with three Panzer divisions. This Operation Wintergewitter (Winter Storm) was doomed to be a failure. The Germans struck with too little, too late. They did not have air superiority and the Soviet operational responses were too great.⁴⁶

On December 16, the Southwestern Front attacked with three Combined Arms Armies (CAA) and the 5th Tank Army.⁴⁷ These exploitation forces surrounded and destroyed the Italian 8th Army, traveling 240 kilometers in five days. The VVS flew 2067 sorties in support during this period.⁴⁸ By December 24 they had cut the Likhaya-Stalingrad railroad.⁴⁹

Because of these ground advances, the Luftwaffe lost access to airfields at Morozovsk, Tatsinskaia, Salsk, Tormosin, and Verkhne-Kurmoiarskii. Airlift and tactical air support aircraft had to be moved to airfields at Novochoerkassk, Rostov and Stalino.⁵⁰ Stalino airfield was

more than 250 miles away.⁵¹ These fields were now at the outer edge of fighter aircraft range to the 6th Army. Additionally, the Luftwaffe could not escort the longer ranged airlift into the pocket.⁵²

The loss of the Luftwaffe's airfields and the gradual loss of their air superiority destroyed any chance they had of supplying the 6th Army. By the end of December, only 60-65 airplanes a day were delivering approximately 100 tons of supplies.⁵³ This was not nearly enough to sustain the pocket.

These longer flights also aided Russian counter-measures. A continuous line of flak positions was set up right along the paths of the Pitomik radio beam, compelling the aircraft to make time-consuming detours and use up fuel intended for the Stalingrad Army.⁵⁴

These large ground advances, however, started to cause a problems for the Soviets. The Soviet ground forces had moved so far forward that fighter bases were now 150-200 kilometers away from the units that needed them.⁵⁵ As a result, fighter response times were considerably increased.

By December 19, the Luftwaffe had flown 1400 sorties in support of Wintergewitter. The Luftwaffe could surge sorties to meet a need, but they could not sustain the effort. The Luftwaffe was forced to fly its airlift at night and shift its air support to the Stalingrad pocket. They also started using Ju-88 and He-111 combat aircraft in addition to airlift aircraft to sustain the tempo of the airlift. Thus the Luftwaffe failure to deny the VVS freedom of action made it even easier for the Soviet VVS to apply pressure against the German Kotelnikovo forces.⁵⁶

In the first week of January, the weather again turned clear. The clear weather was the Luftwaffe's enemy, as now the Luftwaffe could not

fly in the day or at night. For eight days the pocket received no airlift.⁵⁷

On January 10, the Soviets began the liquidation of the pocket. The 65th Army of the Don Front and the 16th Air Army were tasked with the final destruction of the pocket. The 16th Air Army now had 400 operational aircraft, 150 of which were fighters. By now the Germans had already lost up to 190,000 men inside the pocket.⁵⁸ The VVS had attained air superiority and the ground offensive had successfully seized the Potomnik and Bassargino airfields inside the pocket.⁵⁹

In January the 16th AA flew 638 OCA sorties against airfields and 1,186 DCA sorties. The VVS still needed to keep the pressure against the Luftwaffe. While the Soviets did not have a preponderance of airframes over the Germans, their British-supplied air control radar system was more efficient. This extensive air control network helped by scrambling against only valid targets, as opposed to random chance encounters by wasteful fighter sweeps.⁶⁰ A recap of Soviet air operations during December and January is depicted in Figure 23.

<u>Missions</u>	DEC 1942 Sorties	JAN 1943 Sorties	Total
CAS/BAI	1,838	4,483	6,321
DCA/OCA	4,147	2,389	6,536
ESCORT (DCA)	1,757	661	2,418
RECON	1,505	373	1,878
AI (Railways)	204	---	204
Other	<u>1,008</u>	<u>494</u>	<u>1,250</u>
TOTAL	10,459	8,400	18,859

Figure 23 SOVIET SORTIE RECAP, DEC '42--JAN '43

On January 22, the airfield of Gumrak was captured. On the 23rd, the last Luftwaffe aircraft took off out of Stalingradski airfield in the pocket. Luftwaffe aircraft no longer landed in the pocket.⁶¹ All supplies now had to arrive via airdrop.

Under constant pressure, the Germans were thrown back into an interior line around Stalingrad. On January 26, Soviet troops entered Stalingrad, cutting the German grouping into two parts.

On January 31 the southern German grouping in the pocket was captured along with General Friedrich von Paulus. On February 2, the northern group surrendered.⁶²

OPERATIONAL RESULTS

Eight German infantry divisions, two tank divisions and two cavalry divisions were defeated at Stalingrad.⁶³ Soviet claims include: 90,000 casualties, and 1,000 guns, 600 tanks, and 600 aircraft destroyed. In addition, they captured 70,000 personnel, 2,200 guns, 1000 tanks, and 150 aircraft.⁶⁴

The Soviets acknowledge that the German failure to attempt a determined breakout was fortuitous. A aggressive breakout attempt might have been "serious."⁶⁵

Stalingrad showed that the Soviet theory of large mobile formations needed improvement. They wanted highly mobile formations with great firepower to exploit breakthroughs at the fronts. However, the mobility of their rifle divisions at this point in the war would not support this.⁶⁶

The experience of offensive operations of the winter campaign of 1942-1943 revealed that a breakthrough exploitation force must have operational independence, and that mobile formations have to be united on a front scale for actions at operational depth.⁶⁷

Finally, Stalingrad is an excellent example of the concept of "freedom of action" and "freedom of maneuver" at the operational level. As the Soviet Forces held their ground in a CASE III air superiority situation (Soviet bases vulnerable, German bases were not), they gradually built up their ground and air forces. In doing so they took advantage of a changing air superiority status, gradually achieving a CASE I situation. On November 19, the Soviets overwhelmed Rumanian forces in the breakthrough sectors. Within a week, and with a ground maneuver on an operational scale, changed the air superiority status to CASE II, completely in favor of the Soviets.

The Luftwaffe's failure to regain air superiority and Hitler's emphasis on providing airlift in its absence were major operational mistakes. By ceding air superiority to the Soviets, the Germans gave the VVS the freedom of action to deny the Luftwaffe's airlift, as well as concentrate airpower against the Kotelnikovo breakthrough forces.

OFFENSIVE OPERATIONS

Hermann Foertsch once wrote that the difference between offensive and defensive operations was the difference between the destruction of the enemy force and only successful resistance.⁶⁸ Today, that principle still applies. The challenge, however, is for the operational commander to meld the strengths and weaknesses of ground forces with those of the air forces to achieve a single end, operational victory in support of strategic objectives.

1990'S PARADIGM

In order to continue the analysis of operational warfare in a mid-high intensity conflict, a paradigm or model must be developed. This paradigm assumes that the strategic objective is the pursuance of national interests. For this model, the national military strategy, derived from that national strategic objective, requires the defeat of the enemy in the field as a final end state. The means that the operational commander uses to achieve this will be the joint application of ground forces and airpower against a Soviet client state, hereafter known as Red Force. (See paradigm assumptions in Chapter One, Figure 6.)

A notional force structure is presented here. It's purpose is only to illustrate concepts rather than cause questions about force ratio comparisons.

Blue ground forces will be armor heavy with associated combat support and combat service support units. Figure 24 is a depiction of Blue ground units. Note that in this and the following ground orders of

battle (GOB), the emphasis is on combat vehicles, artillery tubes, ADA systems and combat helicopters.

U.S. HEAVY CORPS				
<u>UNIT</u>	<u>TANKs</u>	<u>APCs</u>	<u>ADA*</u>	<u>TL VH##</u>
23rd AD	348	364	96	5264
52nd Mech Div	290	430	96	5291
53rd Mech Div	290	430	96	5291
25th AD	348	364	96	5264
208th ACR	123	189		1584
20 ADA Bde			<u>126**</u>	<u>739</u>
TOTALS	1399	1777	510	23433
	<u>TUBES</u>	<u>A/C#</u>		
Xxth Corps Arty	96			
23rd Arty/CAB@	24	36		
52nd Arty/CAB	24	36		
53rd Arty/CAB	24	36		
25th Arty/CAB	24	36		
208 Arty/CAS	24	36		
Xxth AVN Bde		<u>108#</u>		
TOTALS	216	288		
@ Combat Aviation Brigade				
*Combined Stinger and Vulcan systems				
**Combined Vulcan/Stinger/Chaparall				
#Total AH-64				
## Includes all vehicles for these units including CS/CSS assets.				
Source: G-3 Battle Book, USACGSC, 1989.				

Figure 24 BLUE GROUND ORDER OF BATTLE

With the same emphasis on Red Forces, the Red GOB can be found in Figure 25.

The air order of battle (AOB) for both sides will be the size of a U.S. tactical air force (TAF) and a Soviet frontal air force (See Figure 26 and Figure 27). The intent is not to fight either an independent air or ground war. The assumption is that strategic and operational objectives require the defeat of the enemy by joint air and land forces

SOVIET COMBINED ARMS ARMY

<u>UNITS</u>	<u>TANKS</u>	<u>APCs</u>	<u>ADA</u>	<u>TOTAL VEHICLE</u>
3 Army	1289	1942	735	14205
8 MRD	271	511	172	3563
94 GMRD	271	511	172	3563
207 MRD	271	511	172	3663
160 TD	328	352	145	3416
4 Shock Army	1403	1624	681	13811
25 GMRD	271	511	172	3563
10 GTD	328	352	145	3416
12 GTD	328	352	145	3416
47 GTD	328	352	145	3416
20 Army	1289	1942	735	14205
1 MRD	271	511	172	3563
6 GMRD	271	511	172	3563
14 GMRD	271	511	172	3563
9 TD	328	352	145	3416
11 Guards Army	1346	1783	708	13958
1 GMRD	271	511	172	3563
26 GMRD	271	511	172	3563
1 GTD	328	352	145	3416
37 GTD	328	352	145	3416
		<u>ARTY</u>	<u>ADA</u>	
20 AASLT Bde		56	51	
34 Arty Div		384	219	
1 SSM Bde		27	0	
3 SSM Bde		12	0	
5 SSM Bde		27	0	
1 SAM Bde (SA-4)			51	
4 SAM Bde (SA-12)			51	
7 SAM Bde (SA-8)			20	

NOTES: 1. Figures for each Army by system reflect totals in each division + Army assets.

2. Figures under TOTAL column reflect additional CS and CSS assets.

3. All figures are for illustrative purposes only.

SOURCE: Soviet Battle Book, Soviet Operational Art, A332, USACGSC, 1990.

Figure 25 RED FORCES GROUND ORDER OF BATTLE

(again, see Figure 6). The TAF has been organized to support those objectives. Therefore, this analysis will focus on the operational maneuver on the ground. There might be situations where an organization is better suited for independent air action, but that is beyond the scope of this paper.

BLUE AIR FORCES		
<u>UNIT</u>	<u>TYPE AIRCRAFT</u>	<u>MISSION/ROLE</u>
20 TFW	A-10	CLOSE AIR SUPPORT
25 TFW	F-15	AIR SUPERIORITY
30 TFW	F-16	OCA/DCA, STRIKE
35 TFW	F-111	AIR INTERDICTION /STRIKE
40 TFW	F-4G	AIR DEFENSE SUPPRESSION
45 TFW	A-7	CAS/BAI
50 TFW	EF-111	ELECTRONIC WARFARE
NOTE: Units are notional and are for illustrative purposes only.		

Figure 26 BLUE AIR ORDER OF BATTLE

In this section the strategic and operational objectives have been specified and the orders of battle are outlined. The final part of the paradigm is the operational theater defined in space. Figure 28 is a depiction of the paradigm already shown in Chapter One, however, this time, distances are affixed to show spacial relationships. Note that terrain is not considered, nor is the theater of operations a very large one.

PENETRATION

The penetration is the first step in maneuver theory for a deep operation by ground forces. At the Battle of Stalingrad, the 5th Tank

SOUTHERN FRONT AIR ARMY

<u>UNIT</u>	<u>TYPE AIRCRAFT</u>	<u>MISSION</u>
8 FTR DIVISION	MIG-29 FULCRUM	AIR SUPERIORITY
6 FTR BOMBER DIV	SU-25 FROGFOOT	CAS/STRIKE
23 FTR DIVISION	SU-24 FENCER	OCA, STRIKE
10 INDEP RECON RGT	YAK-28 BREWER	ECM
15 INDEP RECON RGT	MIG-25 FOXBAT	RECONNAISSANCE

Source: Air Force Magazine (March 1990): 69-77.

Note: Units are notional and are illustrative only.

Figure 27 RED AIR ORDER OF BATTLE

Army and the 57th Army had to penetrate through the tactical depths of the 3rd Rumanian Army and the 4th Panzer Army. After the Normandy invasion, Gen. Omar Bradley's First U.S. Army had to penetrate through Generaloberst Paul Hausser's Seventh Army.⁶⁹

This phase of operational maneuver is critical. If the penetration is not successful, the subsequent exploitation and pursuit cannot occur. Forces must be massed at the critical point of attack. Such massing, of course, invites enemy air attacks. Therefore, an extensive operational deception plan must be developed and used to hide the mass and successfully surprise the enemy as to the place and time of the penetration.

At Stalingrad, the Soviet tactical depth was 70-100 kilometers deep just to hide the forces it was massing for the attack. In other operations, especially the Vistula-Oder in 1945, the Soviets massed so many forces on small bridgeheads they were unable to fit another division on the terrain. What made this all the more remarkable was that they successfully hid this grouping from the Germans.⁷⁰

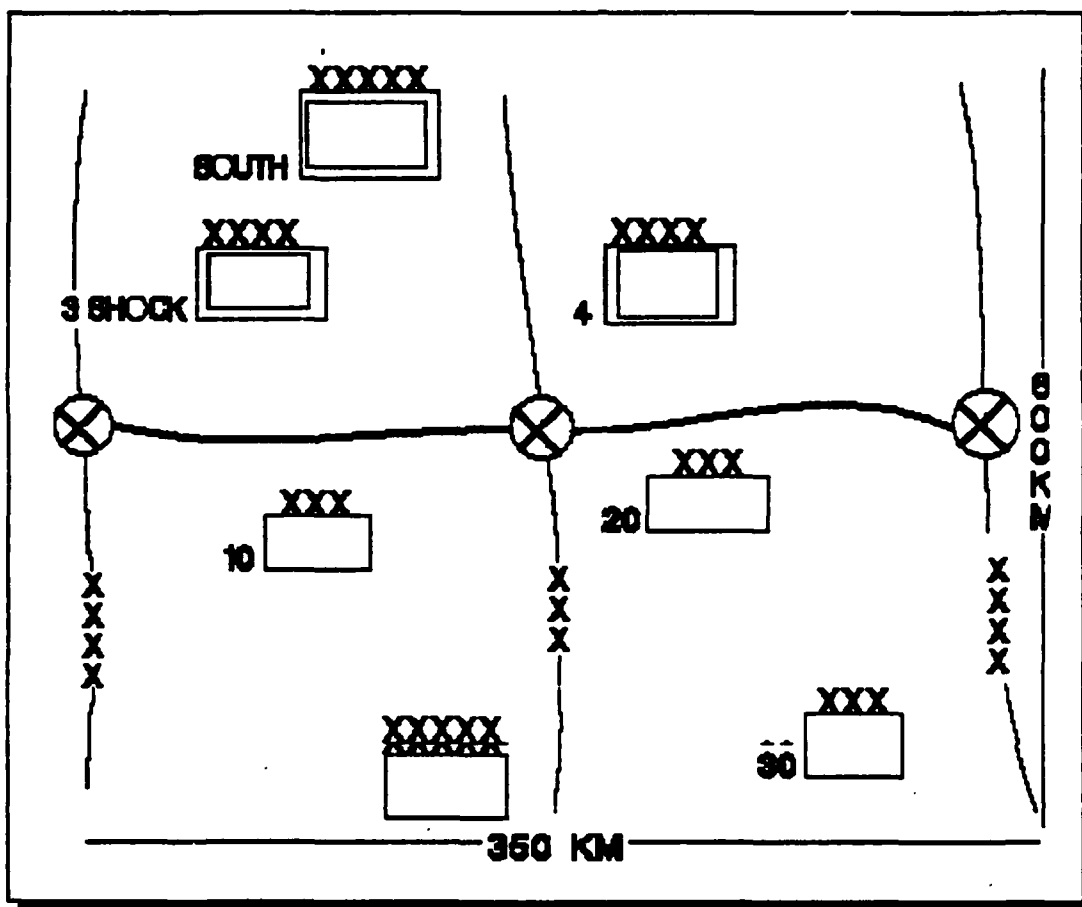


Figure 28 THE OPERATIONAL PARADIGM

The penetration must not only tear a hole in the FLOT, it must "hold back the shoulders" so that the mobile force can penetrate to the operational depths. Therefore, operations must be continued that extend the hole by attacking and holding the flanks.⁷¹

Once the penetration is made, the mobile force must quickly exploit it. If the mobile force cannot hold back the flanks, it will be "pinched off" and separated from its LOC. In Chapter Two, this was referred to as a loss of operational tempo, making the mobile force all the more vulnerable to a counterstroke. Therefore, once the penetration is made, it must be quickly exploited.

Figure 29 depicts a scenario in which a penetration by Blue has begun. The 10th and 20th Corps are on line in a fairly stable frontal situation. 30th Corps has been ordered by the operational commander to conduct a passage of lines through 20th Corps to penetrate the 1st echelon of the 4th Combined Arms Army (CAA), and secure an objective 75-150 kilometers to the enemy's rear. The 4th CAA has four MRD/TDs on line as it seeks to stabilize the front, and prepare to go back on the offensive.

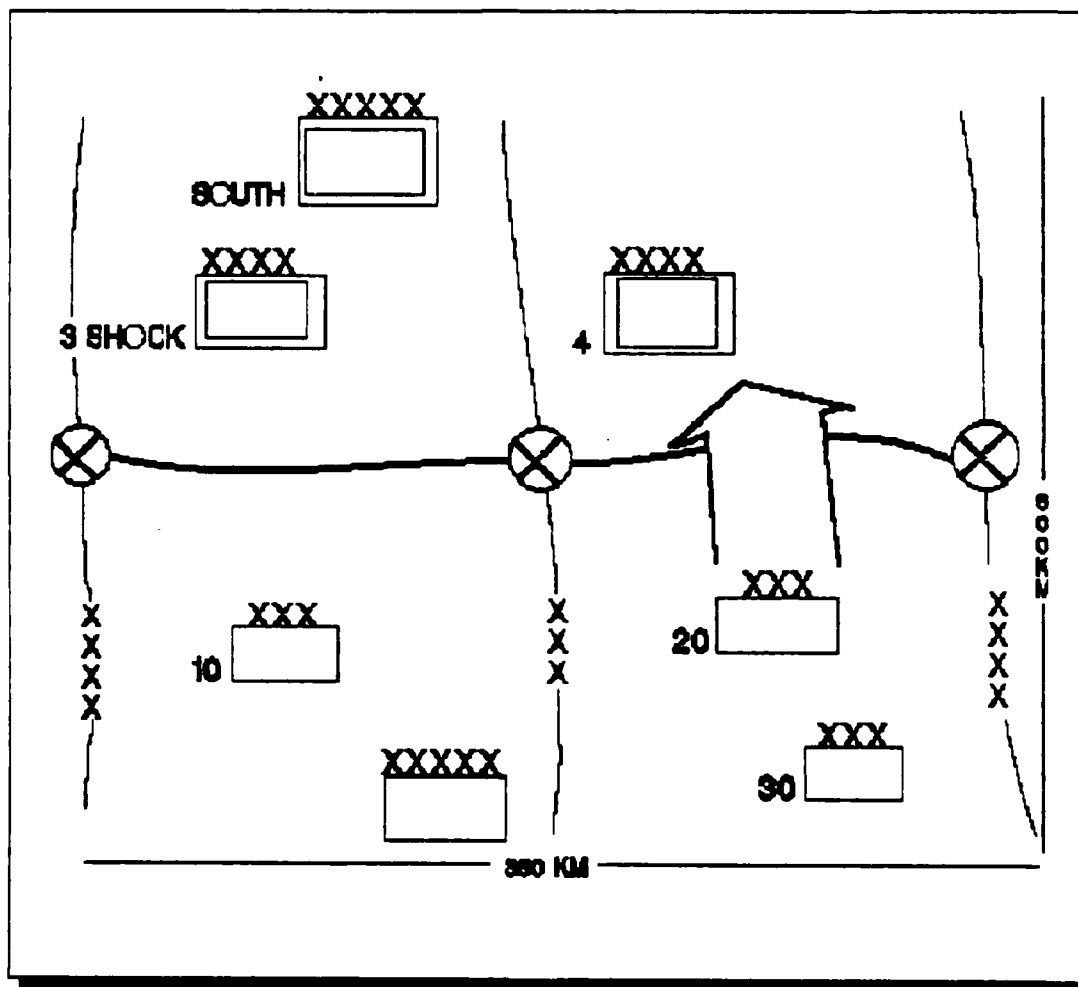


Figure 29 THE PENETRATION

The air support for the operational penetration can be analyzed by using Warden's Air Superiority Cases. Each air superiority CASE reflects

varying degrees of air superiority for both Blue and Red Forces. In Figure 30, the air missions are prioritized for each air superiority case.

CASE I [NEITHER SIDE HAS AIR SUPERIORITY]

In this case, where the ground and air forces of neither side have complete "freedom of action," the main effort must stay with the air superiority war. Air forces must stay offensive by going deep and destroying the air infrastructure of the Red Forces. Under these conditions, air support of the operational penetration would be limited to those single-mission aircraft, such as the A-10, that could not execute offensive or defensive air superiority missions.

<u>CASE</u>	<u>OCA</u>	<u>DCA</u>	<u>AI</u>	<u>BAI</u>	<u>CAS</u>
I	1	1	3	2	2
II	1	3	2*	3	3
III	3	1	2	2	3
IV	3	1	2	1	1
* Priority only after the breakthrough is accomplished.					

Figure 30 TACTICAL AIR SUPPORT OF THE PENETRATION

Any attempt by the operational commander to conduct an operational penetration without air superiority would be, at best, difficult to achieve. The Soviets at Stalingrad had begun to achieve air parity over the FLOT by November 19, 1942. Their allocation of sorties indicates, however, that OCA/DCA was still a priority in the first week in order to give the ground commanders freedom of action.

Operation Cobra, the First U.S. Army's breakout from St. Lo was accomplished under conditions of air superiority. The German attack into the Kursk Salient in 1943 was not. While the First Army broke out from St. Lo, the Germans could not penetrate the defenses at Kursk beyond the tactical depth.⁷²

The German penetration at the Battle of the Bulge was conducted in weather conditions designed to hide and protect the German forces. When the weather finally broke, however, the Luftwaffe did not have the strength to support the armored spearheads and the deep operation failed.⁷³ Weather as a substitute for air superiority is obviously a temporary condition. More importantly, with new fighter and weapons technology, the weather and night is becoming less and less a safe haven for ground maneuver forces.

Local air superiority may be possible to achieve for this penetration. However, as discussed in Chapter Two and Appendix IV (page 190), local air superiority is fleeting, and can only be sustained for very short periods. In WWII the Soviet crossing of the Dnieper River in December, 1943 was successful because the Soviets had local air superiority. They did not have air superiority across the FLOT yet, but because the crossing was operationally essential, the crossing received the air force's main effort until the ground forces established a bridgehead.⁷⁴

If a penetration is directed by the operational commander in this case, OCA and DCA must still receive priority. During the Battle of Stalingrad, 37% of the sorties flown by the Soviets in December were OCA/DCA. This air effort, together with the aggressive Soviet ground offensive that secured multiple airfields, cost the Wehrmacht its freedom

of action on the ground and in the air. Conversely, during the Battle of the Bulge, the Luftwaffe did not make air superiority its first mission. Consequently, when the weather cleared at the end of December, the Luftwaffe had neither the freedom of action to deny the allies their interdiction efforts, nor to support the Panzer spearheads.

The next priority for TACAIR would be CAS and BAI missions to destroy forces at or just beyond the FLOT. In this situation, the forces that can prevent freedom of action at the penetration point are the first echelon ground forces. AI would be last priority until after the penetration had been shaped and an exploitation by the mobile force started.

The impact of weather on operations, both air and ground, will be significant. Should weather preclude operations in one sector or with priority one missions, the inherent flexibility of airpower allows those forces to be switched in ways that will always maintain pressure on the enemy. The air planner cannot discount the ability of airpower to change missions from the CAS orientation to that of deep AI and OCA, often with only a few hours notice.

CASE II [BLUE'S AIRFIELDS SAFE, RED'S ARE NOT]

In CASE II, Blue has established air superiority over its operational rear and airfields. The Blue air commander has "freedom of action" and the Blue ground commander has "freedom of maneuver." Five days after the Soviets started their counteroffensive at Stalingrad, the VVS was in a CASE II scenario. The VVS had freedom of action in their operational rear while the Luftwaffe did not.

Another example of this CASE is Operation Case Barbarossa. Hitler attacked the Soviet Union on June 22, 1941. The Luftwaffe attacked 66 airfields with 637 bombers and 231 fighters. They destroyed 1200 Soviet aircraft, 800 on the ground, in 48 hours.⁷⁵ This opening strike gave the German Wehrmacht operational freedom of action to exploit their penetrations to Moscow without fear of the Soviet Air Force.

A similar situation occurred in the 1967 Arab-Israeli War. The Israeli Air Force attacked Egyptian, Iraqi, Syrian, and Jordanian airfields at the outbreak of the war. In one stroke, the IAF established air supremacy by destroying all of the opposing air forces.⁷⁶

OCA still gets priority in this CASE. Otherwise, Red Air Forces can quickly reconstitute and become operational. In the summer of 1941, the Luftwaffe wiped out the Soviet Air Force. By November, 1942, however, the VVS had rebuilt its air force and was able to build up to at least air parity around Stalingrad. The Luftwaffe had failed to maintain offensive pressure on the Soviet Air Force.

The air and ground campaigns might be synchronized in a CASE II scenario by striking the enemy's air infrastructure soon enough for the attacks to disrupt Red's ability to generate sorties in the rear, but not so early they can rebuild the infrastructure and recommence air operations against the PLOT. At the same time, AI efforts should be directed at interdicting Red LOCs to prevent the flow of supplies and reinforcements to the penetration sector. Should the air commander have the resources available, he could augment these strike packages with OCA escorts to kill enemy interceptors in the enemy's rear, thus augmenting his counterair

campaign. This air operation should also be focused in the few days prior to the actual penetration.

In a CASE II scenario, CAS and BAI targets will be easier to find and easier to exploit. As the ground offensive starts, the battlefields will become mobile and non-linear. Forces will come out of defensive positions, and large reserves and counterattacking forces will be committed. At the same time, enemy ADA will be preoccupied with command and control difficulties, target acquisition problems and expended magazines. In other words, at the tactical level, Red ADA will be preoccupied with the fire and movement of their ground forces and consequently will be easier to suppress. Therefore, for the penetration, particularly after it has developed and forced the battle to assume a more mobile character, CAS/BAI sorties should become more effective.

During the Belgorod-Kharkov Operation in WWII, the Soviet VVS provided air cover to the mobile groups as they passed through the FLOT. Their mission was to counter the Luftwaffe, which launched mass air strikes when the mobile force was committed. The air cover was effective because 50% of the Soviet's 2nd Air Army patrolled over the "FLOT" during the penetration. 40% of the sorties were given to the tank armies for CAS. However, only 10% of the allocation went to interdiction. Thus there was no capability to prevent the German reserves from moving to the front. As a result, the Soviet drive was halted.⁷⁷

This example is illustrative of the balancing act the air and ground commanders must go through as they try to support each other. Too much counterair in an isolated sector can give the enemy the freedom to maneuver in another. Too much AI or BAI in a sector can give the Red air

commander the freedom to interdict Blue ground forces, thus causing their offensive to be halted.

CASE III [BLUE AIRFIELDS NOT SAFE. RED AIRFIELDS SAFE]

In CASE III, Blue is completely vulnerable, while Red is not. Blue's "freedom to maneuver," both on the ground and in the air, is threatened. Since this situation is the most dangerous, a penetration with a follow-on envelopment and exploitation may not be possible.

An operational penetration in a CASE III scenario would place the air commander at a tremendous disadvantage. While he defends the area over the penetration, assuming the ADA coordination works perfectly, he leaves the operational and strategic rear open to Red's air attacks. The Blue air forces might not have any fields to return to, thus negating whatever local air superiority was achieved for that short period of time.

CASE IV [RED/BLUE SAFE. FLOT REACHABLE]

In CASE IV, AI, BAI, and CAS sorties should get the priority. OCA drops to last priority because Red's airfields cannot be attacked. Forward DCA, topcover of the FLOT, will be very difficult to fly given the existing ADA threat. The need for "freedom of action" for the ground forces, however, has not diminished. Therefore, as in the next section on envelopment, fighter sweeps may have to be launched out to the enemy's operational depths in an attempt to defeat enemy TACAIR, one airframe at a time. This would be very similar to the CASE IV situation in the Korean War after China's entrance into the war.

When the Chinese entered the Korean war, they brought a new threat, a fighter threat flying from political sanctuaries across the Yalu River. The only way to protect vulnerable friendly forward bases and LOCs was to shift the main effort from close air support to an offensive counterair effort. This switch in the use of airpower featured:

offensive air patrols along the Yalu, attacks against forward staging bases from which MIGs might strike airfields and the 8th Army, and intensive attacks against the main supply lines of the advancing Chinese.⁷⁸

With air supremacy over the Korean front, the U.S. Army never had to operate in a condition which demanded a response to enemy air action.⁷⁹

Today, the disadvantage to this form of offensive counterair is that the FLOT still has to be penetrated in order to sweep the enemy's rear effectively. TACAIR in Korea or in WWII did not have to contend with the heavy air defense threat today's TACAIR must face across the width and depth of the FLOT. Therefore, should an OCA campaign be needed under a CASE IV situation, a large amount of air (and possibly ground) assets must still be dedicated to suppressing air defenses at the FLOT.

DISCUSSION

Across a wide front, how can TACAIR aid the operational commander in the penetration? Possibly the conclusion should be that TACAIR must gain freedom of action for itself first, and then for the ground forces as it masses for the penetration. If a penetration must be accomplished with only air parity (as the Panzer's had at the Bulge), then the ground forces must be prepared to maneuver under greatly restrictive conditions. TACAIR can be used to support the penetration, but it will probably take all of

its effort to do so, often at the risk of no support elsewhere on the front.

Another way to provide support is as part of an elaborate deception plan. In preparation for the Normandy Invasion, two thirds of the sorties flown in France were directed at the Pas de Calais area. This was part of an elaborate deception plan to continue to confirm the enemy's expectations of the place of main attack. History shows that the ruse, as part of other deception efforts, worked. Today, the same idea still applies:

An air attack which matches the enemy's perception of the operational commander's intent could disguise the operational objective, while actively supporting a potential campaign branch.⁸⁰

A parallel problem to the ground penetration of a FLOT is the penetration of a FLOT by air forces. While the penetration of a "package" at the FLOT is properly at the tactical level of war, it is one of those activities which has operational implications. Not all deep targets warrant expenditure of sufficient effort to obtain saturation of forward defenses, to "penetrate" the defenses. U.S. experience in Southeast Asia (SEA) was that the support force to attack force ratio was on the order of 4:1. Maintaining air superiority to achieve freedom of action for the attacking ground attack force was becoming more involved and complex.⁸¹

The problem is so difficult that "packages" have to be developed to maximize the use of the limited ECM assets the TAF has, i.e., F4G Wild Weasels and escort and/or stand-off jammers. The fighters penetrate together for mutual support, then break up into small flights to go on their separate missions. By the time the package splits up beyond the FLOT, detailed integration of each air mission with the fire and movement of friendly forces is no longer required.⁸²

ENVELOPMENT and TURNING MOVEMENT

An envelopment is a maneuver in which "the enemy's axis is cut behind his main force, possibly as a second step towards encirclement." For the mobile force, the pivot to the rear of the enemy force must "be completed before he can pull back out of the trap." If the enemy has started pulling out early, then the operational commander must quickly push his holding force to maintain pressure.⁸³

In the turning movement, the envelopment has been successful enough to force the enemy to "turn" to face the mobile force. The mobile force is not attacking the flanks of the first echelon, rather it has secured or threatened the enemy's LOCs. If the enemy does not react, it faces encirclement. General von Paulus at Stalingrad was forced to react to the Soviets' turning movement by adjusting his orientation inside the pocket. FM 100-5 cites the landings at Inchon by General Douglas MacArthur as a classic "turning movement."⁸⁴

The difference between the turning movement and envelopment, then, is that the turning movement does not seek to attack the enemy in the flank or the tactical rear. The Operational Commander strives to seize an operational level objective deeper in the rear. A paradigm for the envelopment and the turning movement is in Figure 31 and Figure 32. A short doctrinal discussion is in Appendix IV (page 183).

The principles behind the envelopment and the turning movement are very similar to those of maneuver theory. The mobile force must cause or pass through a penetration, exploit to the tactical or operational depths (depending on force size) and encircle the lines of communications (LOC) so as to cause the out-flanked force to react.

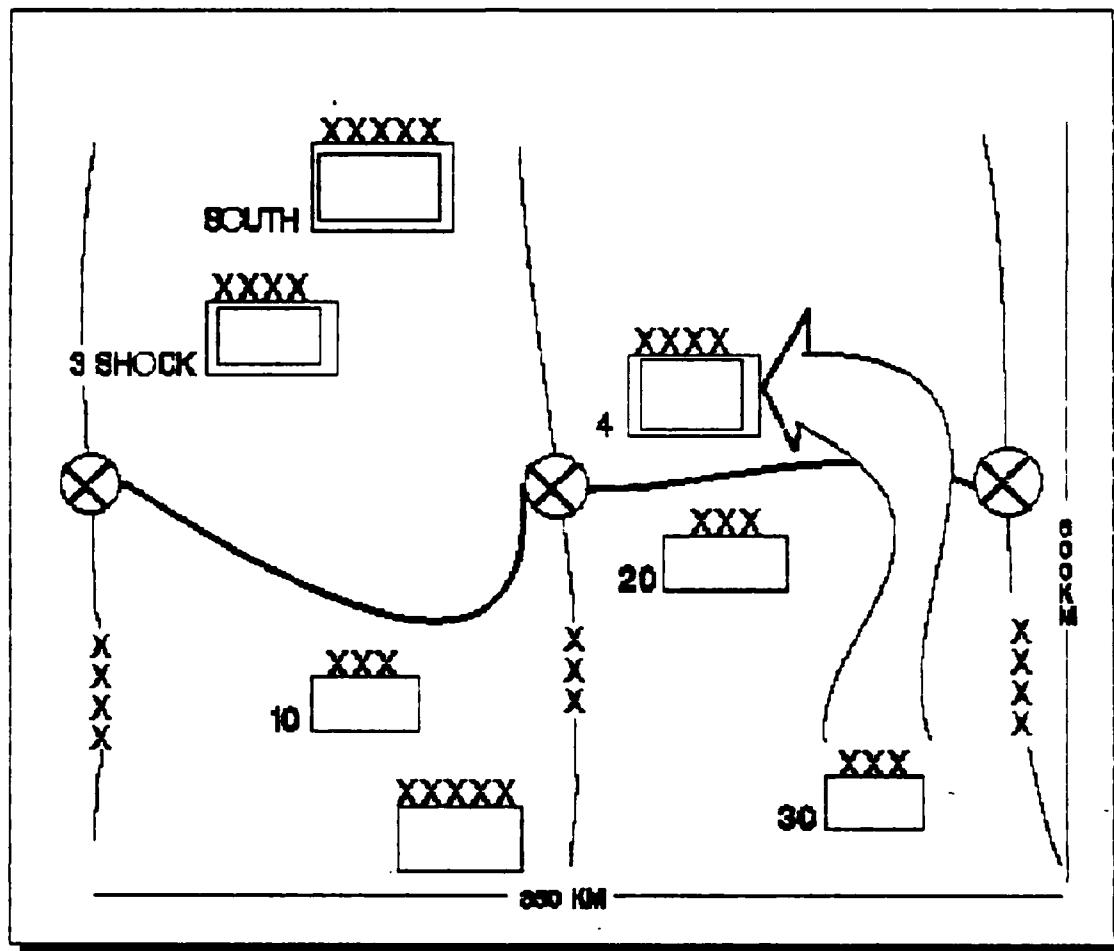


Figure 31 THE ENVELOPMENT

In 1941, the German army successfully accomplished seven envelopments. All of them culminated in complete encirclements at Bialystok, Minsk, Smolensk, Uman, Kiev, Vyazma, Bryansk.⁸⁵ At the Battle of Stalingrad, the Soviets successfully enveloped and subsequently encircled 300,000 Germans. In the final phase of WWII the Soviet Army successfully enveloped *Wehrmacht* forces during the Warsaw-Poznan Operation of the First Belorussian Front: 62,000 soldiers in Poznan, 30,000 in Torun and 28,000 in Schneidemuhl were enveloped by the deep operations of the Soviet Army.⁸⁶ By this time, the VVS clearly possessed air superiority. This air superiority gave the Soviet mobile forces the "freedom of action"

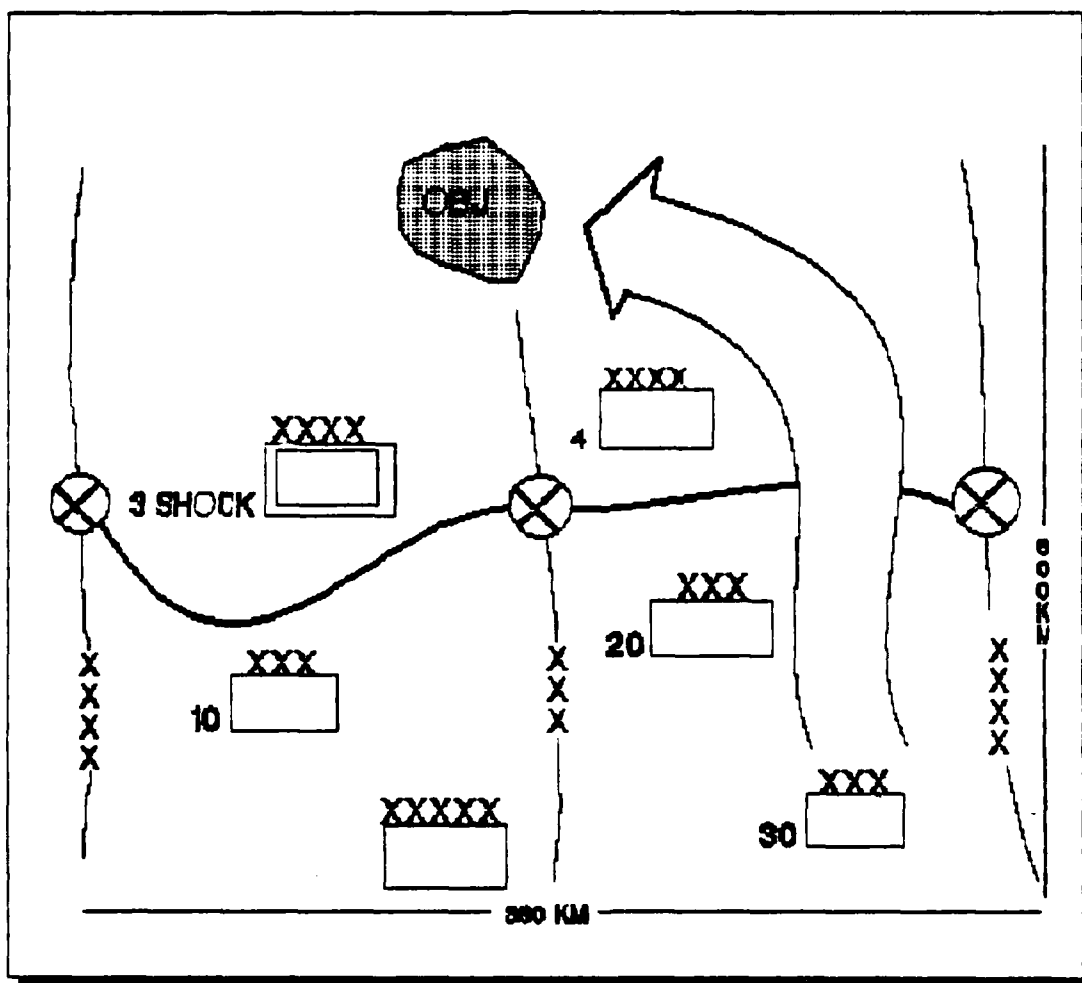


Figure 32 THE TURNING MOVEMENT

needed to conduct successful envelopment operations.

For the envelopment, the paradigm posits a penetration in one corps sector that threatens the integrity of the entire front (see Figure 32). The 30th Corps, moving from a port of debarkation, has been ordered to counter the penetration by striking deep, interdicting the LOC of the 3rd Shock Army and achieve operational objectives.

Figure 33 contains an analysis of the various air superiority cases as they might apply to this scenario. This analysis applies to both the envelopment and the turning movement, the only difference is the degree of impact each maneuver creates. As before, each mission is ranked in order

of priority (1-3). Note that the relative safety of the airbases depends on their distance from the FLOT, and has, in turn, a direct influence on the TAF's ability to support this operational maneuver.[†] In other words, the farther away the airbases and the deeper the mobile force goes, the harder it will be for TACAIR to generate a sustained presence in Red's operational depth--the same as the Luftwaffe at Stalingrad.

<u>CASE</u>	<u>OCA</u>	<u>DCA</u>	<u>AI</u>	<u>BAI</u>	<u>CAS</u>
I	1	1	3	2	3
II	1	3	2	1	1
III	1	1	3	2	2
IV	3	3	1	1	1
PRIORITY: 1, Highest; 3, Lowest					

Figure 33 AIR SUPPORT OF THE ENVELOPMENT

CASE I [NEITHER SIDE HAS AIR SUPERIORITY]

In this situation, should the operational commander elect to execute the deep envelopment, he may have little or no air support for his main effort (the 30th Corps). The only way to defeat the enemy air force's infrastructure is to go deep and knock out the runways, POL, maintenance spaces, command and control (C²). Most of the TAF sorties will be dedicated to that mission. Defensively, the TAF's DCA sorties will be concentrated in the Corps and Theater rear, protecting LOCs and airfields. The TAF will be unable to establish a "defensive umbrella" (a term used in

[†] As mentioned before, the only difference between the envelopment and the turning movement is the distance of the penetration of the mobile force. For the following CASES, both maneuvers are considered as one. Therefore, all references to "envelopment" also include "turning movement."

its broadest sense) over the 30th Corps because of the large numbers of ADA that will be active over the moving front.

What few CAS and BAI sorties are available for this CASE I scenario should be allocated to the breakthrough and penetration of the 30th Corps. The 30th Corps should rightfully become the air "main effort" for CAS and BAI sorties. As for AI, it is likely that very few sorties will be available. If there are any sorties available for AI, they should be concentrated in packages designed to support completely 30th Corps.

The 30th Corps is already getting the preponderance of CAS/BAI sorties, so why should they get the majority of AI sorties? How should these sorties be used? The operational commander is trying to maintain the momentum of the 30th by pushing POL and ammunition down the penetration "funnel." By virtue of being on the move, they are exposed to the operational fires of the Soviet ground forces with VVS support. These forces will be waiting in the operational depths, either in a defensive belt, or massed for an offensive. They will be committed early against Blue's deep operation. Air interdiction can be used to delay these forces by destroying bridges, railroad lines and road networks. Therefore, the focus of the AI sorties, for the duration of the envelopment or turning movement, must be in support of 30th Corps.

Besides delaying deep echelon forces in the counterattack, the AI sorties for Blue could be used to delay and disrupt the movement of forces in front of 10th Corps in their attempt to reposition. In other words, if the intention is to delay the retreat of elements of the 3rd Shock Army, TACAIR can aid in blocking that retreat, much as it could isolate other forces from coming from the outside.

BAI sorties could also be used to destroy forces in near proximity (in terms of time and space) to 30th Corps during the exploitation. If the penetration is fast enough, it is entirely possible that dedicated CAS aircraft will have to be used for BAI also. This would be possible if the air defense threat at the FLOT could be bypassed.

CASE II [BLUE'S AIRFIELDS SAFE, RED'S ARE NOT]

In this CASE II scenario for the envelopment, Blue essentially has air superiority in the rear, but may not have it at the FLOT. Blue ground forces still do not have the "freedom to maneuver" they would like. Red's airfields are vulnerable to Blue's OCA attacks. In this case, OCA still gets priority in a never ending attempt to gain air and ground "freedom of action" at the FLOT.

DCA may drop in priority, since Blue's airfields and operational rear are not vulnerable. However, because of the intense ADA threat, the best way for the TAF to provide defensive "topcover" again, is to go offensive. Therefore, more and more air superiority fighters might be used as escorts for strike packages, in an attempt to gain air superiority by "sweeping" the enemy's rear.

CASE III [BLUE AIRFIELDS NOT SAFE, RED AIRFIELDS SAFE]

In this situation, for whatever reasons, Blue's airfields and rear areas are vulnerable, but Red's are not. Both sides can reach the FLOT with tactical airpower. Now the Red air commander has the "freedom of action" to influence both the ground battle at the front, as well as the air battle in Blue's operational rear.

Warden calls this situation "dangerous."⁸⁷ It might be so dangerous that the execution of any deep operational maneuvers would be impossible. The Blue air commander is trying to influence an air battle in which he cannot strike the enemy air fields or enemy rear.

The Luftwaffe on the Western Front in June, 1944 was in a CASE III scenario. German Field Marshal Erwin Rommel commented on the effects of the enemy air force on his forces as he tried to maneuver in his own operational rear.

Our operations in Normandy are tremendously hampered, and in some places even rendered impossible, by the following factors: the immensely powerful, at times overwhelming, superiority of the enemy air force....the enemy has total command of the air over the battle area up to a point some 60 miles behind the front. During the day, practically our entire traffic--on roads, tracks, and in open country--is pinned down by powerful fighter-bombers and bomber formations, with the result that the movement of our troops on the battlefield is almost complete paralyzed, while the enemy can maneuver freely.⁸⁸

The operational commander will not get his "freedom of action" while his air component is fighting with one hand tied behind its back. The defensive air battle must be fought with all available assets. It might even be realistic to assume that the only way the initiative can be gained is for Blue ground forces to attack Red without air support.

This CASE is tantamount to being on the defensive for both the ground and the air. Should the operational commander choose to exercise the envelopment in this situation, he would find himself with little or no CAS or BAI. Not only would these be the last priority in the absence of air superiority, they probably are the missions the air component commander would be least capable of performing.

CASE IV [RED/BLUE SAFE, FLOT REACHABLE]

OCA and DCA missions usually receive top priority except in a CASE IV scenario where both sides' airbases are not reachable by the others air force. There were several situations on the Eastern Front where the Soviet ground forces had moved so far ahead of their airfields that neither side could reach the other's rear with TACAIR. If the operational commander desires the "freedom of action" he needs to execute a deep penetration by a large force, then he must have some measure of air superiority.

The OCA/DCA sortie allocations are reduced to a point, but never completely eliminated. Pressure must be maintained or else Red can take advantage of an operational pause to mass and strike Blue ground units. The key here is to take Red's freedom of action away from it's air force so that it cannot influence Blue's envelopment maneuver.

The AI, BAI and CAS sorties, especially where there are limited airframes, yield the most effective results when concentrated in support of the operational "main effort." The 30th Corps in the envelopment will get priority of CAS from the operational commander. The CAS allocation should be used in the penetration itself and for the use of the corps spearhead, the lead units of the envelopment. Alternatively, CAS might be used to support the shoulders of the penetration by destroying or delaying enemy units attempting to cut off 30th Corps.

Another good use for CAS in this situation might be to distribute a portion of the sortie allocation to support the 10th Corps in its supporting attack. Using some of the CAS sorties in this manner also indirectly supports the "main effort" because it aids 10th Corps in fixing

the Red forces opposing it. This must be done to prevent them from pulling off line and turning to meet the new threat. This synergism is particularly beneficial because in all likelihood, neither the TAF nor 10th Corps could perform that mission by itself.

CAS action against an enemy defended by heavy ADA, without a corresponding effort by the ground forces, will probably be a hopeless fight. Situations like this happened to the Luftwaffe on the Eastern Front. Luftwaffe assets were used indiscriminately by ground commanders in "quiet sectors," primarily to justify their attachment to ground units in those sectors. The Soviet AAA had nothing better to do than to fight the Luftwaffe. The Soviet AAA had complete freedom of action without the corresponding disruption a ground offensive would have caused.

Fixing forces, therefore, must be primarily a ground force function. Tactically, an increased ground effort supported by artillery fires for the suppression of enemy air defenses (SEAD) will allow CAS sorties to destroy enemy forces. The increased efficiency by TACAIR in turn supports the ground commander. The Red ground commander, therefore, no longer has the operational freedom of action to maneuver forces behind the FLOT, and cannot pull forces off the line to counteract the 30th Corps attack.

Assuming the exploitation goes as fast as expected, it is conceivable that the operational commander would lose track of enemy units on a now non-linear battlefield. Enemy units might be "just over the next ridge" but the fog of war has cluttered whatever operational intelligence was originally available before the attack. Converting force packages into "armed reconnaissance" sorties might be one solution to this problem.

However, to maximize their effectiveness, these packages would still need the best possible operational intelligence from TR-1's (strategic reconnaissance aircraft) and Joint Surveillance Target Attack Radar Systems (J-STARS).

The AI allocation should be used to delay and disrupt reinforcing units coming from the strategic depths by destroying bridges and blocking defiles. Since resources are probably extremely limited, the operational goal should not be how many tanks of the follow-on division will be destroyed, but rather, how long can the units coming from the strategic depths be delayed. The 30th Corps will need 48-72 hours to achieve its objectives. In that time, it will be most vulnerable if Red's reinforcing divisions cannot be stopped and a meeting engagement results. On the other hand, if 30th Corps achieves its objectives, it can secure the LOC, dig into prepared defenses and prepare for the pending attack. Therefore, the concentration of effort for the AI resources should be on delay and disruption, not destruction.

DISCUSSION

This particular operational maneuver has some interesting but serious ramifications for air command and control as well as sortie allocations. Assume that the 30th Corps envelopment has penetrated into the operational depth, 75-150 kilometers, in less than 72 hours. Blue ground forces have now maneuvered well past the traditional Fire Support Coordination Line (FSCL). Yet, CAS sorties, doctrinally, and BAI sorties, by necessity, must be provided to the ground commander to shape his battle. How does the air commander insure separation of those sorties?

The obvious answer might be by reshaping the FSCL and the reconnaissance/interdiction line. But how does the air commander determine when AI sorties should be converted to BAI sorties because of the ground situation, especially in as fast moving a scenario as is depicted here?

Another major problem for the air commander will be the routing of his air forces to their designated target areas. The traditional means of getting TACAIR across a FLOT when ground forces are deployed underneath has been through minimum-risk routes. However, in a mid-high intensity conflict, minimum risk routing implies that Blue artillery are tightly controlled and Blue ADA can only engage "hostile" targets, thus preventing fratricide.

It is conceivable that, as a fighter package penetrates 10th Corps' area to support 30th Corps, the fighter package might have to penetrate the air defenses of two FLOTs four separate times. For example, a package of 40 aircraft has the mission of destroying a tank regiment (TR) located at 30th Corps' objective. Enroute, and following traditional routing procedures, the package penetrates the FLOT in front of 10th Corps' area. It will have to pass through the 1st echelon ADA of the 2nd Shock Army. Continuing on, it must now pass through the ADA of that TR's parent division or Army, engage the unit and return. If it returns through 10th Corps' area, it must now penetrate the ADA again.

The best "minimum risk" route, then, might be directly over the attack axis of the 30th Corps. However, asking 30th Corps to shut its artillery and ADA down flies in the face of the ground commander's need to execute his attack plan with no restrictions. A heavy corps in the offense would find it very difficult to turn on and off the fire support

of an entire corps with any degree of confidence. On the other hand, the 30th Corps commander will desperately want TACAIR to help create the conditions he needs to push to the operational depths.

One solution has been alluded to already; 30th Corps is the ground main effort for the operational commander. Let 30th Corps have its CAS "firehose" fly up its attack axis in support. In this manner, it is more responsive and easier to control.

Since the 10th Corps mission is not to "destroy," but to "fix," insure that one of its primary missions is the "passage of lines" of the air main effort in support of 30th Corps. This means that the SEAD mission becomes the Corps' priority mission during TACAIR overflight periods. That is to say, as part of the feints and demonstrations being executed in the 10th Corps sector, minimum risk routes will be scheduled over the top of 10th Corps. During these periods, the majority, if not all, ground fire support must be directed against enemy ADA in their sector. This fire support would include: artillery, attack helicopters, and electronic warfare jamming support. This possible solution is depicted in Figure 34.

This may well be the only solution to the multitude of conflicts that exist between air and ground forces and their priorities in this scenario. In this situation, the air forces are supporting the ground main effort by flying a "main effort" for CAS in support of 30th Corps. To insure success and minimize losses with cross-FLOT operations, TACAIR needs FLOT crossing routes or minimum-risk routes. 10th Corps is now supporting the TACAIR main effort by providing SEAD as a major mission. The main effort in the 10th Corps sector is now the support of TACAIR.

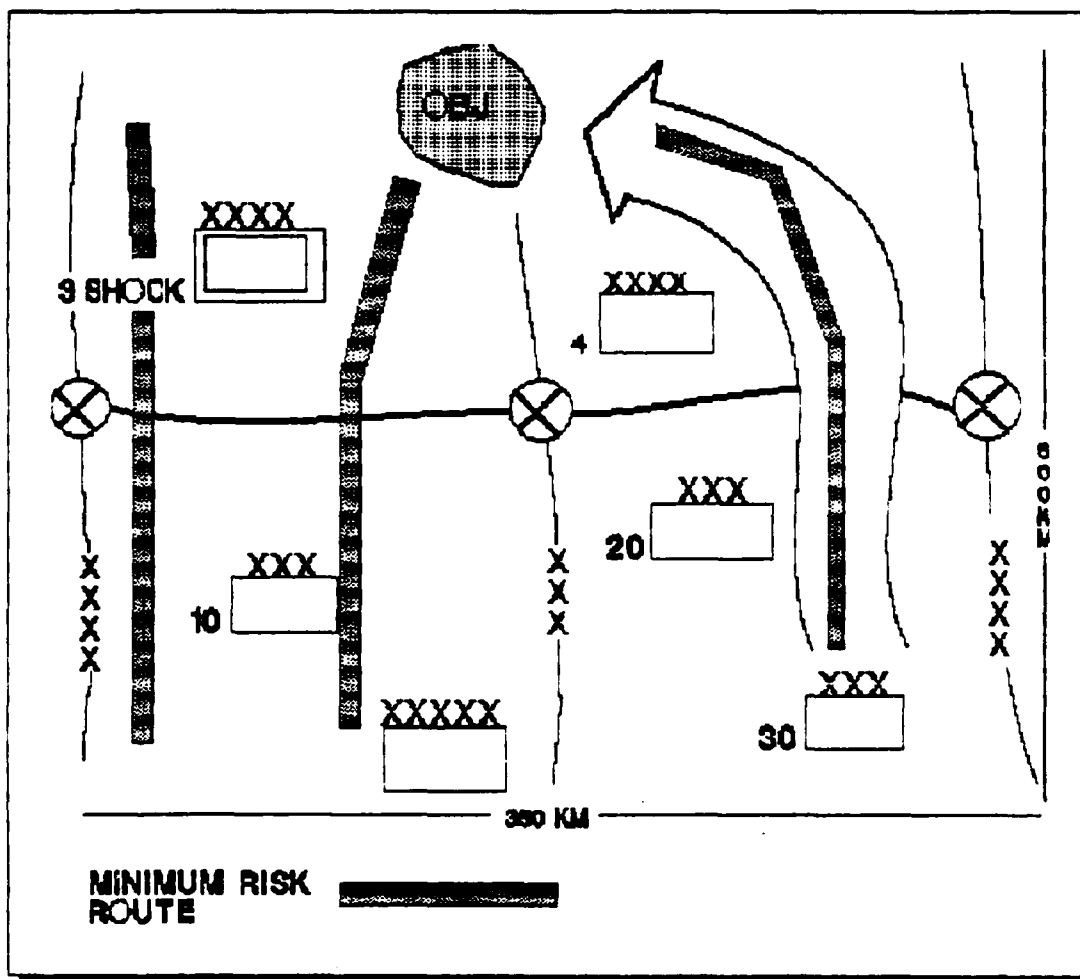


Figure 34 MINIMUM RISK ROUTES IN THE ENVELOPMENT

FRONTAL ATTACK

The frontal attack is chosen as the operational maneuver of last resort when a penetration and envelopment cannot be done. In this situation, there is no other way to swing a flank or to penetrate the PLOT. Consequently, the whole front, or a large portion of it, must go offensive. According to FM 100-5, the frontal attack should be used in situations when "speed and simplicity are paramount."⁸⁹

While a frontal attack has the virtue of being the shortest distance to an operational goal, it does have disadvantages. It violates a major principle of war, concentration. It also tends to limit the focus of the operational commander:

The first effect of a frontal attack...will be only to push back the hostile front for a certain distance, and it will not be able to attain an early decision. It gives the enemy an opportunity to retreat in time, to hold up the offensive with a part of his forces, and to create for himself new bases for future operations.⁹⁰

A well developed deep operation can easily evolve into a frontal attack across a wide front as the operational commander takes advantage of collapsing defenses. The Allied operations on the Western Front in WWII and some frontal operations on the Eastern Front in 1944-45 had the characteristics of a broad frontal attack.

The frontal attack paradigm in Figure 35 envisions the 10th, 20th, and 30th Corps on line to take advantage of the Southern Front's retrograde operations. These operations will soon develop into a pursuit.

Figure 36 contains another analysis of the air superiority cases for the operational frontal attack. Note that, since air superiority has been achieved in CASE I and II, OCA/DCA sorties are now less important. Therefore, the emphasis on sorties has shifted to BAI, CAS and AI.

Also note that no analysis has been attempted for the CASE III scenario. Three out of the four CASES lend themselves to effective employment of airpower for the frontal attack. CASE III is not one of them. Since the TAF does not have freedom of action, the operational commander will not have "freedom of action" for either his ground or air forces. Therefore, until the pendulum of air superiority has swung back in Blue's favor, it would be ludicrous to attempt a broad frontal attack

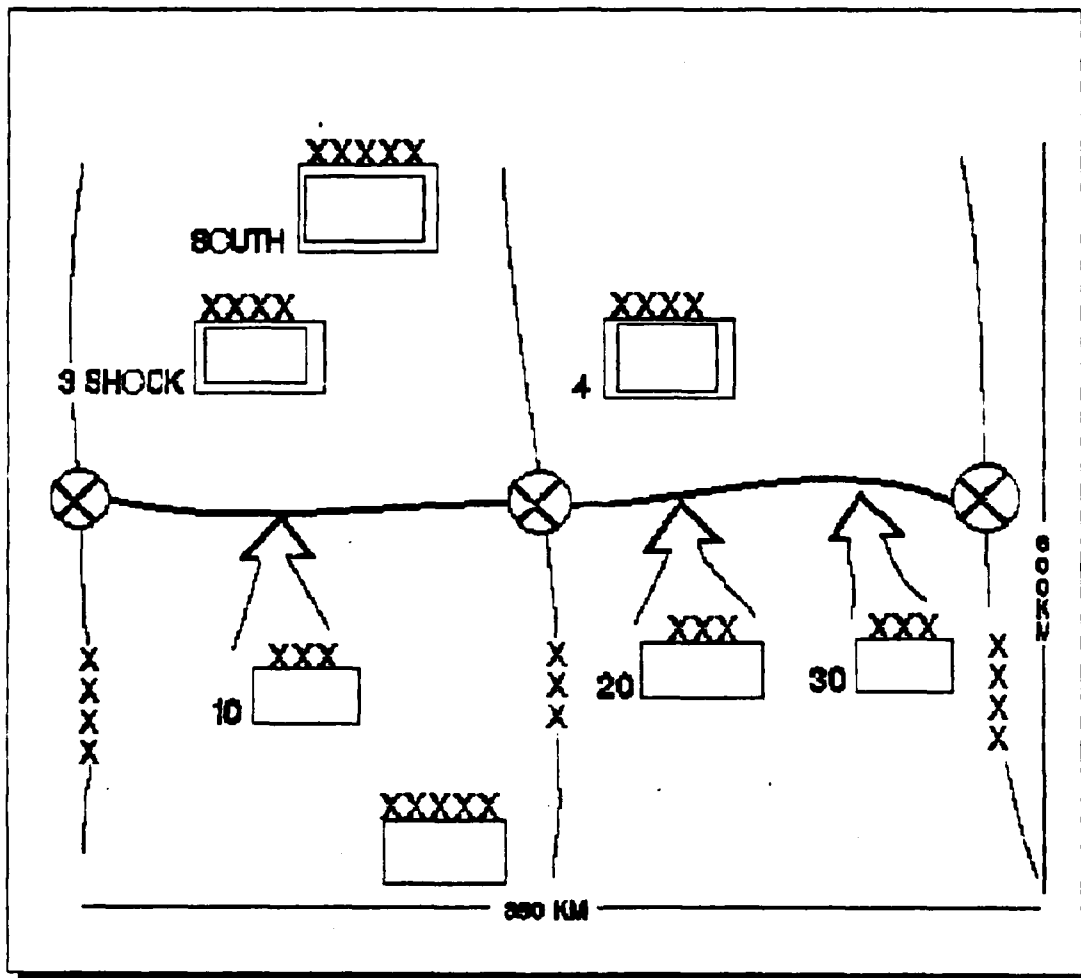


Figure 35 THE FRONTAL ASSAULT

<u>CASE</u>	<u>OCA</u>	<u>DCA</u>	<u>AI</u>	<u>BAI</u>	<u>CAS</u>
I	2	2	1	1	1
II	2	3	1	1	1
III	--	--	--	--	--
IV	3	2	1	1	1

Figure 36 TACTICAL AIR SUPPORT OF THE FRONTAL ATTACK

where neither air nor ground forces can be concentrated.

The effects of air interdiction will be particularly noticeable during a frontal attack paradigm. If the assumption is made that the frontal attack is the result of a long stabilization of the FLOT, then interdiction has been traditionally used as one means to keep pressure on the enemy, with varying degrees of success.

Operation DIADEM in Italy is an example of an offensive conducted in this manner. The air interdiction campaign, Operation Strangle, was used to destroy German supplies and reinforcements during the long periods leading up to the ground offensive. Air interdiction, however, did not have a great effect on the Germans until a ground offensive started. A ground offensive in conjunction with an aggressive AI/BAI operation forced the Germans to use up their forward stores of fuel and ammunition, stores which could not be replenished due to AI. Here the "Army played its essential part by breaking in, maintaining the pressure, forcing him to fight and expend, and exploiting his weakness by the thrust...[to the North]."⁹¹

SUMMARY

If there is one theme in this chapter, it might be that air superiority is essential for almost all offensive operations that the operational commander might envision. There will be times when the operational commander might wish to go on the offensive without at least air parity; however, history has repeatedly shown the foolhardiness of such actions.

You may have to embark on the land or sea battle before the air battle is won. I think it would be dangerous for the Army to get into the way of thinking that they cannot fight unless we have air superiority. They may have to....But it is quite certain you will not win the land battle unless you have pretty well got command of the air; you will not be able to turn to the offensive which is the only road to victory on land, as at sea and in the air.⁹²

Airpower helps ground forces by securing freedom of action for the ground forces. By the same token, ground forces help airpower by denying territory that could have been used by Red for airfields or ADA positions.⁹³

At the other extreme, the loss of air superiority not only denies the Blue ground commander freedom of maneuver, it also denies it to Blue's air commander. Blue TACAIR no longer has the ability to generate sorties at rear bases, nor can it concentrate at critical points in time and space.

The above analysis for offensive operations can be used as a guide for the employment of airpower in the operational offensive. The relative priorities for each of the maneuvers and air superiority CASES, will determine the priority of allocation for those missions. If OCA/DCA has priority, then it would be reasonable to assume that those missions would get the preponderance of sorties--the counterair mission would become the operational main effort. Only single role aircraft that cannot swing to OCA/DCA would be left to use in the remaining missions.

In any given situation, if the majority of sorties are allocated to the Air Superiority campaign, the second theme of this chapter is that the remaining sorties can and should be used efficiently. Rather than broken across a wide FLOT, the sorties must be focused so as to inflict

the greatest damage on the enemy's operational center-of-gravity, the mass of his ground forces.

The third theme of this chapter is that SEAD for the concentration of airpower across a FLOT is an operational activity. As such, it must become a primary mission for air forces *as well as ground forces* until the need for crossing that FLOT has become mitigated.

CHAPTER THREE ENDNOTES

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¹³*Ibid.*: 286.

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- ²⁰Rotundo: 230, 243.
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- ²⁴*Ibid.*: 234-5.
- ²⁵*Ibid.*: 71.
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- ²⁸Ivan Matveyevich Ananyev, *Tank Armies In The Offensive*. Trans. by the Joint Publications Research Service (JPRS) (22 November 1988): 143.
- ²⁹*Ibid.*: 21.
- ³⁰Wright: 289.
- ³¹Wright: 288.
- ³²Sources differ as to how many VVS sorties were flown. The number quoted is in Rotundo: 243-4. See also Wagner, ed. *The Soviet Air Force in World War II* (1973): 137-8.
- ³³Rotundo: 244.
- ³⁴Janusz Piekalkiewicz, *The Air War, 1939-1945* (1985): 224.
- ³⁵Ananyev: 143.
- ³⁶Rotundo: 244.
- ³⁷*Ibid.*: 135.
- ³⁸Wright: 290.
- ³⁹*Ibid.*: 290.
- ⁴⁰Piekalkiewicz: 225, 255.
- ⁴¹*Ibid.*: 225.
- ⁴²Rotundo: 245.
- ⁴³Piekalkiewicz: 225.

- ⁴⁴Rotundo: 246.
- ⁴⁵Wright: 290.
- ⁴⁶Rotundo: 114.
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- ⁴⁸Wagner: 140.
- ⁴⁹Ananyev: 143.
- ⁵⁰Rotundo: 247.
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- ⁵⁴Bekker: 422.
- ⁵⁵Rotundo: 252.
- ⁵⁶*Ibid.*: 123, 247, 252.
- ⁵⁷Piekalkiewicz: 242.
- ⁵⁸Rotundo: 138, 253.
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CHAPTER FOUR

DEFENSIVE OPERATIONS

INTRODUCTION

Defensive operations are conducted for any number of reasons. Foremost, they are conducted to defeat an enemy attack. However, the defense can also gain time so that forces can concentrate elsewhere. Defensive operations may control key terrain so as to create conditions in which the enemy can no longer continue. Finally, defensive operations can be used to secure strategic, operational or tactical objectives.¹

With all defensive operations, however, the initiative remains with the attacker. One of the challenges for the operational commander will be knowing when to go on the defensive, how long to stay there, and how to create the conditions under which going back on the offensive becomes possible. As Colonel Colmar von der Goltz stated:

The commander must himself select the proper moment for the change to the defensive, and possess sufficient force of character to relinquish a continuation of the offensive voluntarily, if he desires to retain what he has already won. But in deliberating on the situation, he should bear in mind that the losses which he perceives in his own army unwittingly produce a greater effect on him than those which his imagination assigns to the enemy....To delay passing over to the defensive until the last moment, and then to make the change of one's own accord is the highest achievement of the art.

The relationship of airpower to ground power during the defensive can be characterized as "strained". While ground forces might be trying to trade space for time they will most likely be concerned with the effectiveness of CAS at the FLOT. This reflects their view of the reality of the moment. This is, of necessity, a very narrow tactical viewpoint, especially in light of the modern ADA weapons available to the Red Force commander. This viewpoint conflicts with airpower's natural tendency to want to go offensive, to wrench the initiative from the enemy by destroying his air force and thus taking away the enemy's freedom of action in the air.

Probably the most difficult defensive scenario for an air commander is when the enemy can strike Blue's airfields, but the enemy's airfields are immune from attack (Warden's Case III). An air force on the defensive, however, still has characteristics which can be used to great advantage. Using range and flexibility, the air commander can concentrate forces from great distances in a short time.

The history of air war...has shown clearly that masses in the air can only be opposed by counter masses. Attempts to defend with inferior numbers (in a particular battle)...have been notably unsuccessful.

As acknowledged previously in Chapter Two, a ground force in the defense is the stronger form of warfare. This is not necessarily true for airpower. The offense is the stronger form here. Therefore, the theme of this chapter might be: while the operational area may be on the defense, which implies use of both air and ground forces, the characteristics of airpower might best be used by going offensive against the enemy's center of gravity--his air force first, and then his ground forces.

In this chapter, three defensive operations will be considered: retrograde operations, attack into a salient, and encirclement. Each of these situations have significant effects on how ground and air operations interact. A short description of the U.S. Army's doctrinal concepts of mobile and area defense is on page 186 in Appendix IV.

RETROGRADE OPERATIONS

The paradigm for retrograde operations assumes that after the first week of a major war, Red Forces have achieved strategic and moral surprise. 10th, 20th and 30th Corps are executing retrograde operations. The TAF is at 50-60% strength because of Red Forces' preemptive attacks. Conceptually, Blue's air and ground forces are on the strategic defensive and must find a way to wrest the initiative from Red.

See Figure 37 for a depiction of this scenario. Figure 38 is the standard analysis of TACAIR support of retrograde operations for this paradigm.

CASE I [NEITHER SIDE HAS AIR SUPERIORITY]

There have been very few defensive situations in modern warfare where both sides had at least air parity while the ground offensive underneath was collapsing. In almost every instance of a successful attack and follow-on campaign, the contending air forces fought until one side or the other won freedom of action in the air. If the attacking air force won, the attacking ground force was now provided the freedom of action to continue the offensive.

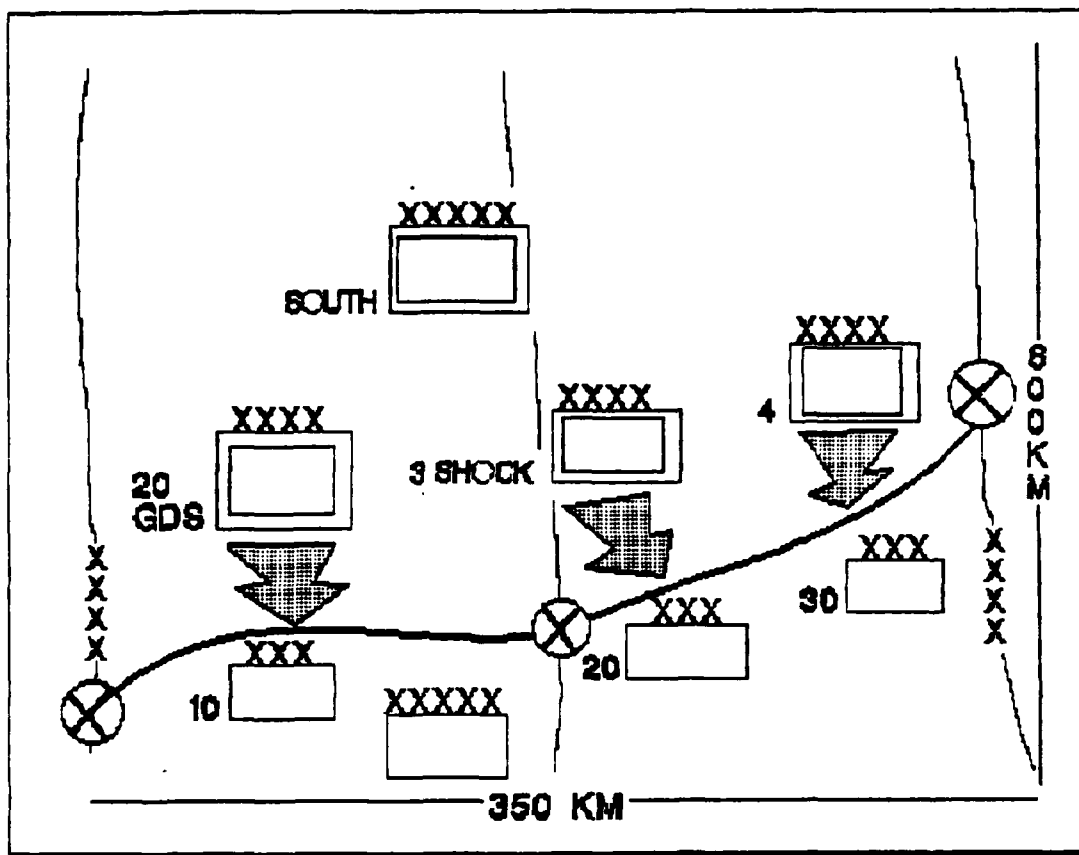


Figure 37 RETROGRADE OPERATIONS

<u>CASE</u>	<u>OCA</u>	<u>DCA</u>	<u>AI</u>	<u>BAI</u>	<u>CAS</u>
I	1	1	2	2	3/2*
II**	1	1	2	3	2
III	3	1	2	2	3
IV	3	1	2	2	3

* Priority dependent on ADA threat and ground situation.
 ** Scenario is unlikely.

Figure 38 AIR SUPPORT OF RETROGRADE OPERATIONS

Three wars in recent history did occur where the attacker failed to defeat the defender's air force in the first days of the war. All of

these wars ended in defeat for the attacker or stalemate. The first was during the Korean War.

After the North Korean invasion, the two relatively small air forces fought until the UNC regained the initiative in the air. The ground offensive eventually reached a stalemate until the landing at Inchon.

The second example occurred during the 1973 Arab-Israeli War. The efforts of the Egyptian and Syrian Air Forces on October 6, 1973 did not destroy the IAF. While some preemptive attacks were made against Israeli airfields, there was not a sustained effort designed to eliminate IAF capability.⁴ Within two days of the initial Egyptian and Syrian attacks the IAF was generating 790 sorties on the combined fronts and increasing to 1318 sorties on October 11.⁵

The attacking Egyptian ground force had established air superiority when it crossed the Suez Canal under their SAM umbrellas. While the IAF did have to regroup initially after losing numerous aircraft to SAMs, they eventually had a significant influence on the Egyptian Army after the IDF ground forces captured those same Egyptian SAM sites.⁶

The third instance was during the Battle for the Falklands in 1982. The Argentine Armed Forces were successful in achieving their initial objective, the seizure of the Falklands. However, after the arrival of the British Task Force, the Argentine Air Force failed to maintain air superiority over the Falklands. During the conflict they lost 106 aircraft (British claim) to only nine of 36 British aircraft lost. More importantly, the Argentine failure to maintain air superiority gave the British forces the freedom of action necessary to land a ground force on the islands.⁷

In a CASE I scenario for retrograde operations, then, the operational commander should count himself lucky if he still has an air force after the first few days of fighting. If he does, then the air superiority campaign must quickly and unequivocally become the operational main effort in order to take the initiative away from the enemy. In a sense, the operational commander makes his TACAIR his center-of-gravity so as to create the conditions for a stalemate or a counteroffensive.

Made under very trying conditions, this decision must be weighed against whatever benefit might come from withholding the air effort to directly support ground forces with BAI and CAS. On one hand, the air superiority fight inhibits Red air's freedom to attack Blue ground forces directly. On the other hand, if Blue's air force is directed to support the army exclusively with CAS and BAI, there may be very little synergism achieved from destroying first echelon enemy ground forces. More importantly, this situation would give Red Air enormous freedom of action to strike friendly airfields, LOCs and reserve forces.

Therefore, where possible, freedom of action must be taken away from the Red Air Force. Even if this can only be done temporarily, it might be possible to phase OCA attempts in concert with planned withdrawals to phase lines, thus giving Blue ground forces the opportunity to withdraw.

Next, AI and BAI against Red's ground forces might be next. The farther an attacker advances from his supplies, the sooner he will lose tempo in his attack. This priority might be especially true if a complete dedication to CAS is causing unacceptable losses from mobile SAMs. In the 1973 War on the Sinai, the IAF lost 50 of 350 fighters aircraft to SAMS in the first three days of the war. Until the SAM belts were handled by IDF

ground forces, the IAP concentrated on targets that did not require penetration of the belt.⁸

If unacceptable losses are occurring from ADA, one way to use airpower would be to concentrate along minimum risk routes as described in Chapter Three. Using all available air and ground assets, TACAIR would penetrate the FLOT air defenses and hit AI and BAI targets, especially bridges and forward logistics points.

CASE II [BLUE'S AIRFIELDS SAFE, RED'S ARE NOT]

In this situation, while Blue's ground forces are retreating, Blue's air forces have the freedom of action to provide support at the FLOT as well as take away Red's freedom of action in the air. Under these conditions, the operational commander should now be able to stabilize the FLOT, reinforce forward, and go back on the counteroffensive at the first possible moment.

In February, 1943, the Wehrmacht had fallen back onto their own airfields. The Luftwaffe of the Don Front was able to reconsolidate as the German forces in that region executed retrograde operations. General von Richthofen's Fourth Air Force [Luftflotte 4] was reinforced to 950 aircraft. This was 53% of the Luftwaffe on the Eastern Front. When the Soviets maneuvered beyond the range of the VVS, the Luftwaffe successfully reestablished air superiority over the FLOT, thus stopping the Soviet advance. By massing forces at a critical point, the Luftwaffe was able to support Army Group Don in their counterattack at Kharkov. Indeed, the freedom of action that was available to the German operational commander, General Erich von Manstein, allowed the outnumbered Fourth Panzer Army to

execute the counterstroke in the Ukraine which defeated the Soviet First Guards and Sixth Armies.⁹

During the Korean War, U.S and South Korean forces were initially forced into a pocket around Pusan. Fifth Air Force's close air support averaged a miserly 175 sorties a day.¹⁰ The majority of air force sorties after July 8, 1950 were used for CAS and BAI during the retreat.¹¹

What made this dedication of sorties to ground support possible, the freedom of action to switch from OCA/DCA to CAS and AI, was the establishment of air superiority over the operational area by July 20, 1950. After considerable harassment by the North Korean Air Force (NKAF), General Douglas MacArthur ordered a switch in priority so that UN forces could gain control of the air. Fifth Air Force and U.S. Navy Task Force 77 accomplished this by major airfield attacks from June 29 to July 20th. Along with numerous air battles, Fifth Air Force reduced the NKAF from 132 combat aircraft to approximately 65, thus disabling the NKAF's ability to influence the ground battle.¹²

As North Korean LOCs became extended and United Nations forces gained air superiority, 5th AF fighters and bombers were able to have a significant impact on the enemy force. The effect of 5th AF was such that the North Korean Army was unable to penetrate the weakened perimeter at Pusan. They had neither strength nor supplies to accomplish the task.¹³

After air superiority is established, CAS may not be the best method for using airpower in a retrograde operations. This is particularly true if the Blue air force is relatively small. The relatively few total sorties used in CAS many have very little impact operationally. Somehow, the momentum and tempo of the enemy's advance must be slowed down so that

the ground forces can hold the first echelon and conduct complicated withdrawal plans.

This situation occurred after the Chinese attacked United Nations Command (UNC) on November 1, 1950. Initially, the air effort was dedicated to CAS to the exclusion of all else. It was not until some of the air effort was dedicated to stopping the forward flow of reinforcements and supplies of the Chinese that a stabilized line was possible by 22 Dec 1950.¹⁴

CASE III [BLUE AIRFIELDS NOT SAFE, RED AIRFIELDS SAFE]

Here, the initiative lies entirely with Red. It is incumbent on the Blue air commander to find some way to regain the initiative, probably with far inferior air forces than Red has. Only by regaining freedom of action in the air can freedom of action on the ground be regained. It might be fair to say that when freedom of action on the ground and in the air has been lost, the complete withdrawal of friendly forces from the theater may be required, but very difficult to achieve.

The Wehrmacht on the Eastern Front was in a Case III scenario after Kursk in 1943. After the Battle of Kursk, instead of concentrating, the Luftwaffe dispersed squadrons in the Stalino, Belgorod and Orel sectors. The Soviets had started another broad front offensive. Only 1000 Luftwaffe aircraft were available. Those aircraft were used to support numerous local counterattacks instead of being concentrated for one purpose: to deny the Soviets the freedom of action to maneuver.¹⁵

Of tremendous importance during retrograde operations is the need to deny the enemy the use of friendly airfields at all costs, yet preserve

them for friendly use up to the very last moment before evacuation.¹⁶ At Stalingrad, the airfields were Army Group Don's decisive point. When the airfields fell, the army group's center-of-gravity, the 6th Army, also fell.

In a retrograde paradigm, therefore, the best conditions that an operational commander can hope for is to retreat until he can regain freedom of action for either his ground or air force. As he retreats, he destroys any airfield he withdraws from to deny their use to Red Air Forces. Thus, as Blue retreats, he falls back on his own LOCs, both ground and air, until Red becomes overextended and reaches their own culminating point. How far back Blue forces will have to go will be determined by their ability to sustain ground forces in defensive positions and generate tactical sorties to support those ground forces.

While it is necessary to maintain DCA sortie allocation during the retreat, the air commander must be aware of when abandoned airfields are becoming serviceable again for Red's use. Now the main air effort must be switched to OCA, runway-killing missions to prevent the Red operational commander freedom of action and bring Blue's Air Force closer to the front.

CASE IV [RED/BLUE SAFE, FLOT REACHABLE]

It will be very difficult to envision a scenario in retrograde operations where neither Blue's nor Red's operational rear is safe from attack. In modern warfare, for mid-high intensity conflicts, the possibility of a CASE IV scenario is indeed remote. Therefore will not be discussed further in this chapter.

ATTACK INTO A SALIENT

It is entirely conceivable in the battlefield of the future that one part of the front remains stable while the other has to accept pressure and withdraw. Salients are the bane of an operational commander for two reasons. Psychologically, they give the enemy the appearance of having achieved a victory. Secondly, they give the enemy the opportunity and freedom of maneuver necessary to strike into Blue's rear faster, and with more momentum.

As the various CASES are analyzed for an attack into a salient, the operational commander must integrate his air and ground power in such a way that the battle does not degenerate, either on the ground or in the air, into one of attrition. The objective, as always, is for the air forces to retain freedom of action. So doing should enable the ground forces to retain or regain their freedom of maneuver, allowing them to attack into the salient, and force the enemy to lose his freedom of maneuver. A figure depicting a salient created by an OMG is in Figure 39.

CASE I [NEITHER SIDE HAS AIR SUPERIORITY]

Probably the best example of this air superiority case is the Battle of Kursk. The *Wehrmacht* was on the strategic and operational defensive. Both the Germans and Soviets both ground and air power into the Kursk sector. The *Luftwaffe* had two thirds (2000) of their aircraft allocated to Kursk operations.¹⁷ The Soviets sent three air armies and two fighter divisions into combat totaling 3200 aircraft.¹⁸

In May 1943 six Soviet air armies conducted two large scale "independent air offensives." These were, in effect, OCA campaigns as the

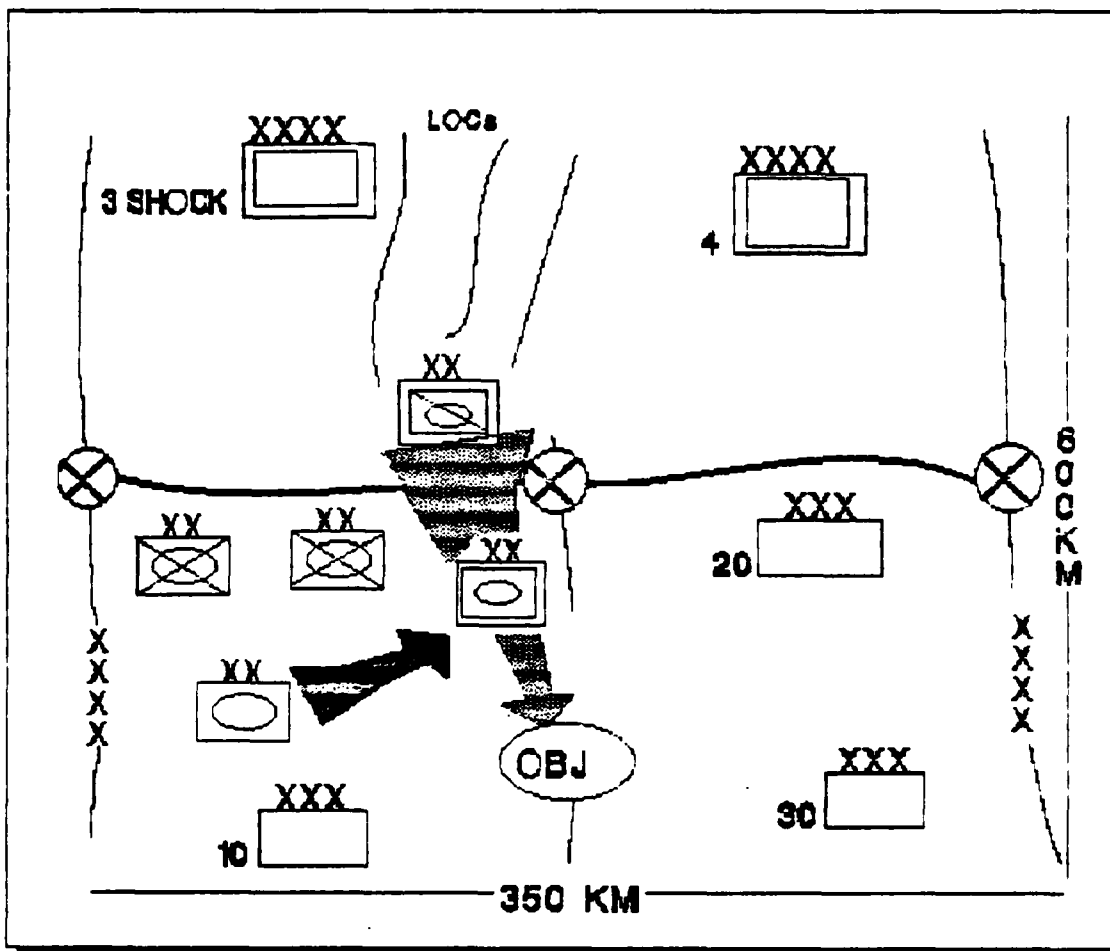


Figure 39 ATTACK INTO A SALIENT CREATED BY AN OMG

Soviets claim they killed 700 planes. However, they did not achieve air superiority.

While Kursk is best known as the greatest tank battle of WWII, it was also an immense air battle. During one stage of the battle, 2000 aircraft were working in an area 12 by 37 miles. Battles of 100-150 planes were not unusual.¹⁹

Both sides claimed they had air superiority during the battle, and in fact, the Germans claimed more Soviet aircraft killed.²⁰ However, the difference was in the overall weight of the effort. While the Soviets lost more aircraft, they had much more air and ground reserves to push

into the fray, thus causing the German ground offensive to grind to a halt.

If German pilots inflicted heavy losses on Soviet fighters and bombers, their opponents simply put up more aircraft, while German losses inexorably mounted.²¹

On the morning of July 5, a dawn air battle occurred which gave the Germans local air superiority over the southern flank of the salient. Sitting on airfields were 1700 Luftwaffe aircraft, waiting to support the offensive. The Soviets launched a massive air raid on those airfields. Luftwaffe fighters launched to protect the bombers waiting on the ground. What resulted was "the largest air battle of the war."²² Two Geschwader (a Group, about 100-120 aircraft) of German fighters met 400-500 Soviet bombers, fighters and ground-attack aircraft.²³ The Soviets lost 120 aircraft in the mass raid. The total for the rest of the day was 432 Soviet aircraft to only 26 German.²⁴ However, despite what on the face of it was a stunning victory, the Luftwaffe still did not gain air superiority over the operational area.

The air war over Kursk was one of attrition.²⁵ The Luftwaffe was overcommitted in other theaters and could not concentrate its airpower at Kursk. The retreat from Orel, the Kharkov battle and a massive offensive on the Donets made excessive demands on the ability of the Luftwaffe to accomplish its task.

Even with their preponderance of airpower, however, the Soviets failed to use it to prevent the movement of reserves at the Front. Consequently, the German army with Luftwaffe support was able to prevent the encirclement of the German Ninth Army at Orel during the closing stages of the battle.²⁶

The Battle of Kursk depicts a failed attempt by Germany at penetrating a large salient fortified with heavily prepared defenses. The Germans were unable to overwhelm the Soviet defenses already built in the salient. They also failed to regain air superiority and, in fact, never regained it for the rest of the war. By putting their main effort into the Kursk salient, the Soviets outnumbered the Germans and succeeded in winning a major battle of the war.²⁷

The effectiveness of the Russian fighter aviation was essentially its ability to force the *Luftwaffe*, and above all the German bombers, to take measures and adopt dispositions that reduced the effect of German air operations and increased the German air effort without bringing compensating results.²⁸

For this case paradigm, the lack of air superiority must drive the air commander to an aggressive offensive campaign to regain the initiative. An attack into a salient, particularly before the Red forces have an opportunity to improve the defenses, can serve to destroy whatever momentum Red forces had. Therefore, the benefits of an aggressive ground counteroffensive may outweigh the absolute need to achieve air superiority prior to the start of the offensive. However, if the defenses are developed and mature, then the counterair campaign must be won if the ground forces are to have any hope for success.

CASE II [BLUE'S AIRFIELDS SAFE, RED'S ARE NOT]

Another example of an attack at a salient might be similar to one created by an OMG. The penetration is mature, but the mobile force is unable to prevent a counterattack. The objective of the mobile force is to create situations to which the defender must react. Its advantages lie in its tempo, not its mass. If the mobile force becomes over-extended, it

will break.²⁹ An excellent example of this occurred during German General Erich von Manstein's Counterstroke in March, 1943.

The Soviets attacked the 2nd Hungarian Army south of Voronezh on January 15, 1943, at about the same time the Soviets were concentrating on the defeat of the German 6th Army at Stalingrad. Since the Germans could not hold, the Russians opened a gap 175 miles wide, captured Kursk and maneuvered southeast of Kharkov. Their goal was the Dnieper River crossing at Zaporozhe, a main supply depot of Army Group Don. By February 21 the Soviets had reached the Dnieper and were near Zaporozhe.³⁰

By February 23, the Red Army had overextended itself and by the third week in February, the Southwestern Front had no more reserves.³¹ The Soviet advances had carried them beyond their airfield and supply organizations. The Soviet VVS could not support their ground force advances. This gave the Luftwaffe the opportunity to provide undivided support for the German ground forces. They had regained air superiority and had swung back to a CASE II scenario.³²

The German ground force situation was bleak, but not hopeless. In fact, General von Manstein was outnumbered 8-1.³³ While the Soviets operated widely separated axes, the Germans attacked in concentrated Panzer corps.³⁴

The counterstroke began on February 22, 1943. The time and place of the attack came as a complete surprise to the Soviets.³⁵ The First Panzer Army drove the Soviets back to the Donetz River. Manstein's supporting air army, Luftflotte 4, played a significant role by delaying and attacking the Soviet armor until ground forces could counterattack. The Fourth Panzer Army drove northeast toward Kharkov. "Richthofen's

[Luftflotte 4] aircraft substantially aided the advance and managed to destroy large Soviet forces attempting to escape."³⁶

By March 6, 615 tanks were destroyed and 1000 guns captured. Manstein had been able to carry out a successful withdrawal over hundreds of miles, launch a counterattack on a large scale, eliminate the threat of encirclement, and inflict heavy losses on a victorious enemy. He was also able to reestablish the southern front from Taganrog to Belgorod as a straight defensive line. Even though outnumbered 8-1, the Germans had created an operational environment for success and stopped a major offensive.³⁷

The operational commander must create conditions in which the air forces can reconstitute and apply pressure on the enemy. With the attainment of air superiority, the TAF can use BAI and AI to delay and disrupt the OMG in the salient and at the throat until ground forces arrive.

CASE III [BLUE AIRFIELDS NOT SAFE, RED AIRFIELDS SAFE]

Blue's loss of freedom of action in the rear (its airfields and operational rear are vulnerable to air attack), will have a significant effect on Blue's ability to defeat a salient in the front. Because of the paradigm's depiction of an OMG in the rear, this is particularly true (see Figure 39). If the assumption is made that the OMG has its full complement of ADA, the freedom of action in the rear for both air and ground forces will be affected. The OMG in the salient, for this paradigm, would have up to 317 ADA weapons. TACAIR will have difficulty

defeating the OMG because of the ADA, and the ground forces may not be able to defeat it if there are no reserves to send to it.

ENCIRCLEMENT

Since WWII, the greatest defensive operational encirclements the U.S., British, French and South Korean armies experienced were at Dunkirk, in the Ardennes during the Battle of the Bulge, and Pusan. In all these cases, it took the combined efforts of sister services and international forces to defeat the enemy and save the encircled forces.

As already detailed, the Germans and the Soviets on the Eastern Front in WWII experienced some of the greatest encirclements in modern warfare. The Soviet encirclement of the German 6th Army is just one example. This section of Chapter 4 focuses on what can be done to rescue a friendly encircled force under varying air superiority cases. A rescue is possible. The question for the operational commander is: How to extract an encircled force with minimal effect on the rest of his operational forces?

The paradigm for this section envisions two divisions of the 20th US Corps encircled in the first few weeks of a conflict (See Figure 40). Since Blue forces are on the defensive, the Blue TAF and ground forces are at 60% strength.

Current Soviet doctrine states that the encirclement will have an inner and outer ring, much as they did in WWII at Stalingrad. The purpose of the inner ring is to hold in and destroy the encircled force. The purpose of the outer ring is to hold out any reinforcements trying to break out the encircled force.³⁸

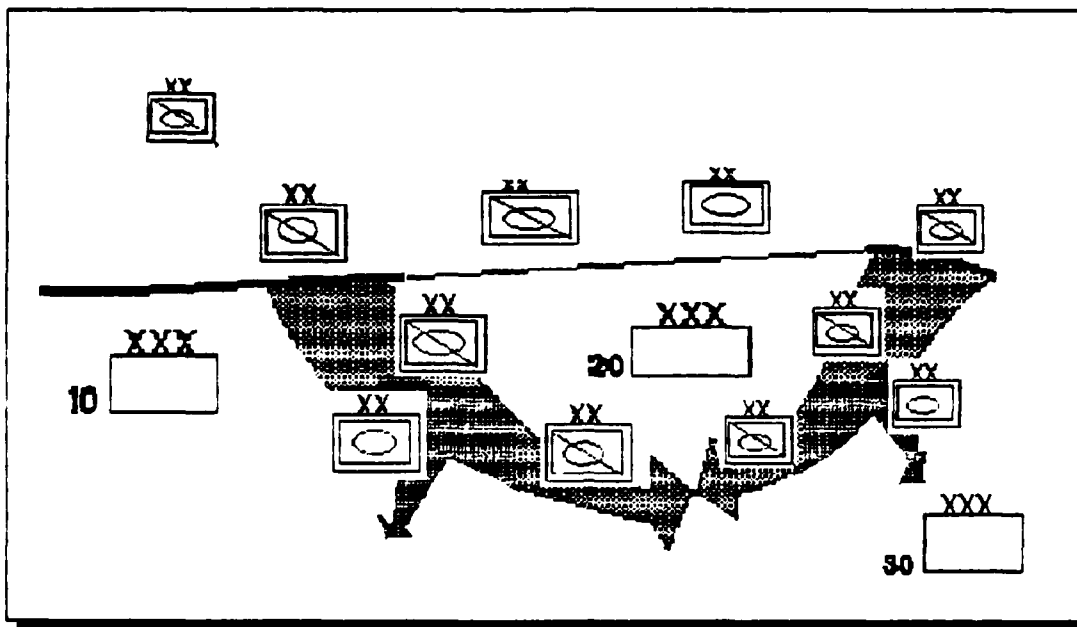


Figure 40 ENCIRCLEMENT

Bastogne, Pusan, Dunkirk, and Stalingrad are all examples of encirclements where airpower had an effect on the end results. TACAIR support of a breakout of an encircled force in the 1990's however, is bound to be considerably more complicated. In WWII and the Korean War, the largest surface air defense weapon was the towed AAA weapon. Today, TACAIR will face the combined strengths of an integrated air defense system, the same system which killed 16% of the Israeli fighter force in three days in 1973.

In this paradigm, the 20th Corps has been encircled by two combined arms armies, elements of the 3rd and 20th CAA. Each army has a total of 735 ADA weapons, ranging from SA-7s to SA-12s. Additionally, the holding force facing the 20th Corps is only two divisions in an economy of force role. More importantly, the Front has moved up their Frontal ADA (SA-4s) to cover the 20th Corps lodgement. Those ADA rings are depicted in Figure 41.

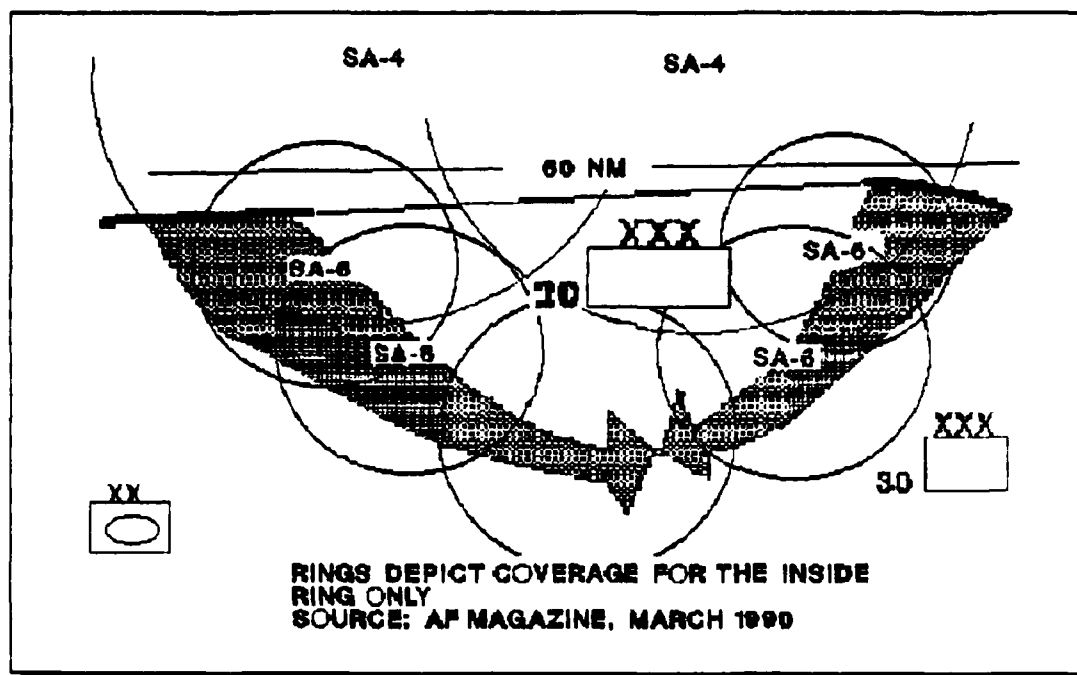


Figure 41 RED ADA RINGS OVER AN ENCIRCLED FORCE

This paradigm assumes that Blue operational commander wants to have 20th Corps break out from the encirclement to preserve the force and reestablish a linear front, if possible. The ground commander will use elements of a Corps to strike one leg of the pincer. At the same time, the 20th will attempt to break out towards the southeast. See Figure 42 for the breakout plan.

CASE I

Even under conditions of air parity, it would be very difficult to provide any direct support to the 20th Corps. CAS for the 20th Corps implies the destruction of enemy ground forces in close proximity to 20th, a feat which may near be impossible because of the ADA threat. The ADA of the enemy's encircling pincers have taken away nearly all freedom of action from the Blue air commander.

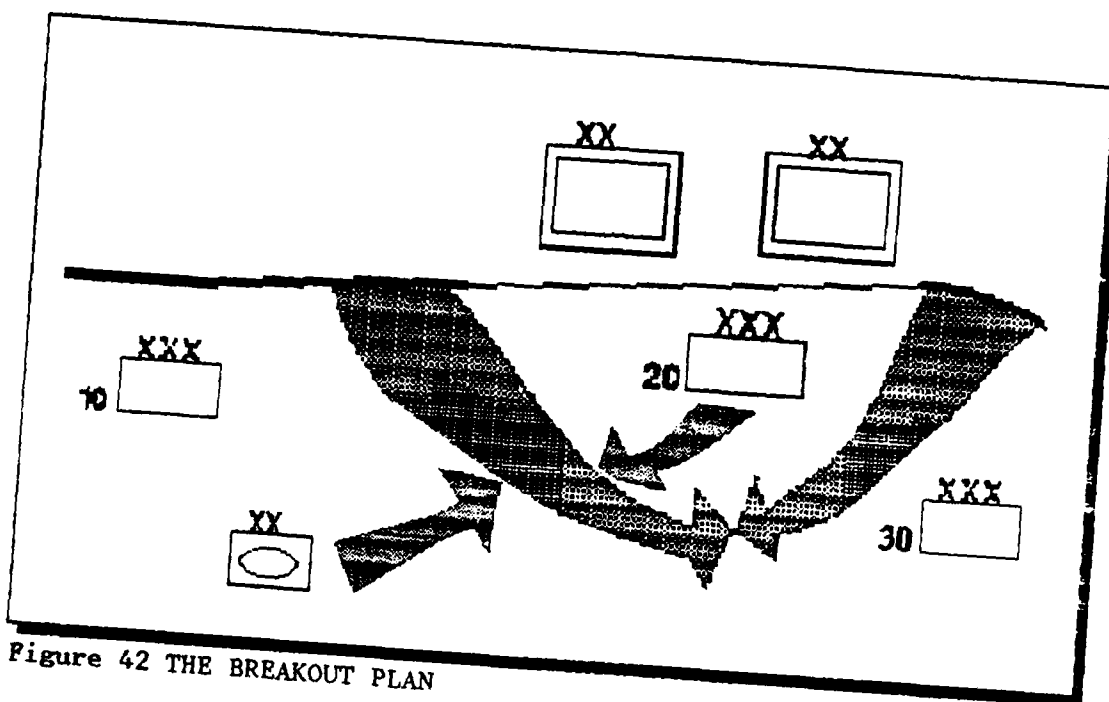


Figure 42 THE BREAKOUT PLAN

Since the encircling forces are Red's center of gravity, the Blue operational commander can expect that maximum logistics and air support will be provided to those forces. If the ADA of 20th corps is in a depleted state, Red is likely to concentrate strike aircraft on the pocket in an attempt to destroy the Blue force. Every action Blue takes in the air will be fought aggressively by Red ADA and interceptors. Much as at the Battle of Kursk, wherever Blue sends its main effort in the air or on the ground, Red will respond in kind.

Therefore, the first priority, again, must be to take away Red's freedom of action in the air. This must be done not only to minimize Red's air attacks on 20th Corps, but also to prevent Red's interference in Blue's air operations. The limited forces that Blue has must be able to concentrate on the destruction of a corridor through the inner and outer rings.

Those forces that are left might be used for CAS/BAI against the outer ring. Of most importance, however, is that close air support for the inside pocket will probably not be available until a penetration corridor is established using SEAD and large scale ground maneuver.

CASE II [BLUE'S AIRFIELDS SAFE, RED'S ARE NOT]

In a CASE II situation, the TAF can now concentrate on SEAD, interdiction of the two CAAs, and CAS for the penetrating Corps. The tide has swung back in Blue's favor.

SEAD operations will have to be a coordinated effort between the TAF and all of Blue's ground forces, including 20th Corps. It will have to become the *operational main effort*.

One way to accentuate Red's problems might be to provide CAS and BAI for the penetrating Corps, while at the same time, trying to create air corridors across the pocket, at times and places of Blue's choosing. This might be possible, if, as mentioned before, all of the fire support and electronic warfare of 30th and 20th Corps are employed with a coordinated TACAIR operation to open time-sensitive corridors through the envelopment arm. In this manner, CAS aircraft can penetrate through the corridor and fly across the pocket. This will give the Blue CAS pilots time to coordinate attacks and support the 20th Corps as it begins its breakout to the Southeast. See Figure 43 for a possible solution to the problem.

This operation will obviously be very intensive for both air and ground forces. An idea of the amount of sorties necessary to accomplish this operation can be found by examining WWII's Operation Market Garden. During the support of this abortive operation and the subsequent rescue of

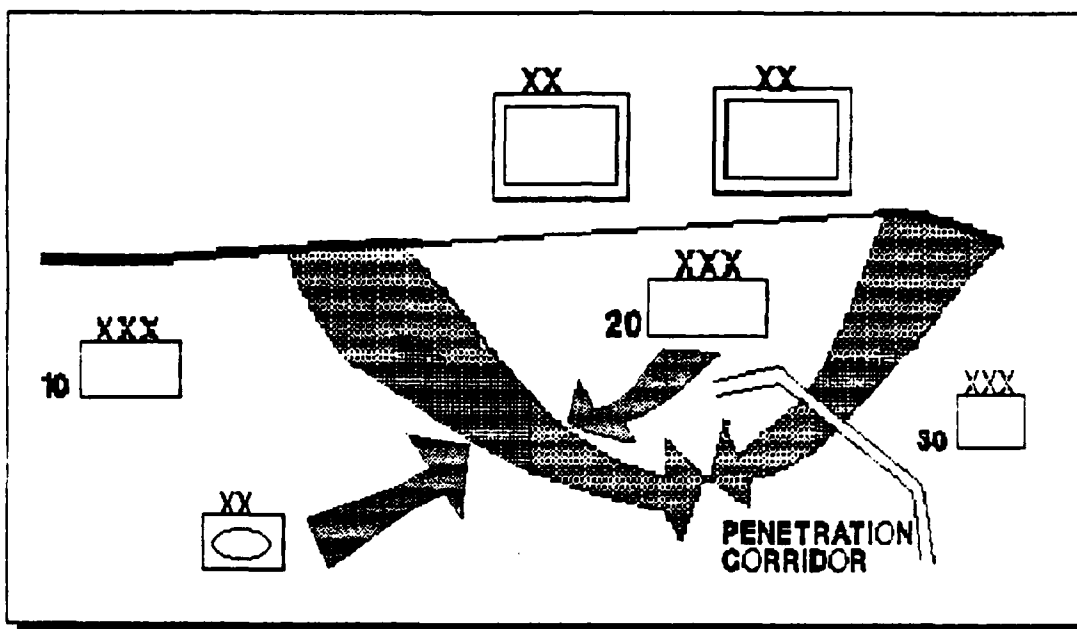


Figure 43 CAS CORRIDORS FOR AN ENCIRCLED FORCE

the British 1st Airborne Division, the Allied Air Forces in eight days flew 6172 sorties of all types, both TACAIR and airlift.³⁹ Doubtless, this scenario would entail much more.

CASE III [BLUE AIRFIELDS NOT SAFE, RED AIRFIELDS SAFE]

Here again is a situation where the ground forces may not be able to operate with the support of the TACAIR to which they have grown so accustomed. If TACAIR is understrength and does not have the freedom of action to operate in either the rear or at the front, then it must dedicate all its resources to regaining at least a CASE I, and preferably a CASE II situation.

The solution in this CASE must be to concentrate all the airpower in the operational area, and make the main effort the encircled 20th Corps. Air forces would have to be pulled from out of theater to swing the situation back to one favorable for Blue. The operational commander must

understand that even with this "maximum effort" the air superiority over the encirclement and the subsequent relief operation probably will be barely tenable at best.

Close Air Support of the penetrating corps would be strictly limited to single role aircraft that could not otherwise be dedicated to OCA. All other aircraft would be directed at Red's air force in a concentrated effort.

SUMMARY

In the defensive scenarios discussed in this chapter, the ability of both the air and ground force commanders to synchronize their operations will become even more difficult. Tremendous risks will have to be taken in order for one or the other component to seize the initiative, possibly at the tactical level so that operational success can be insured.

The principles to be gained from this chapter are very similar to those of Chapter Three. Air parity, or better, can give an operational commander freedom of maneuver and action not possible otherwise. If air support is the *operational main effort*, then joint SEAD by air and land forces may become a primary mission for supporting forces, both in the air and on the ground.

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CHAPTER FIVE

CONCLUSIONS AND RECOMMENDATIONS

This thesis has attempted to answer the question: How can Tactical Air Forces best support the operational commander in his maneuver of large ground forces? Various operational maneuvers and situations have been analyzed against John Warden's four air superiority CASES to determine a common theme for mid-high intensity warfare at the operational level of war.

Succinctly put, the following are the conclusions to be gained from this thesis.

1. Except in very rare situations, operational maneuver in mid-high intensity warfare will always require some measure of air superiority to be successful.
2. Until air superiority is gained, the operational commander does not have freedom of action in the operational rear for either his ground or his air forces.
3. Airpower offers the operational commander the ability to go offensive in the enemy's operational rear to take away the enemy's freedom of action in the air and on the ground.
4. In order to gain air superiority, the TAF may have to become the operational main effort while ground forces are consolidating.
5. TACAIR may need the dedicated support of both air and ground forces to concentrate and cross a heavily defended FLOT. This requires that SEAD become a major operational activity in holding force sectors.

6. Ground forces can help to create freedom of action for TACAIR at the tactical and operational level of war.

7. In conditions when the enemy has air superiority, consideration for major operational maneuvers will have to be weighed against the potential loss to both air and ground forces in large battles of attrition.

8. Individual air or ground battles, in and of themselves, will probably have no immediate effect on the other. However, the proper conduct of major operations have significant impact on the capabilities of a ground and air force.

9. The operational employment of airpower can create the conditions for success for a ground force at the tactical level. This, in turn, can insure success at the operational level of war.

This thesis has attempted to show the interrelationships of air and ground power at the operational level of war. The value of this study lies not so much in its clarification of tried and true principles, but rather in its illumination of ideas and concepts which may provide a better understanding of the benefits inherent in the operations of a true air and land battle team. Each component, the air and the land, brings unique capabilities and characteristics to the team so that a strong fighting force, whose whole is truly greater than the sum of its parts, can be fielded.¹

Maneuver theory has been used by many defense reformers as a means to change the organizational inertia of many of the West's defense establishments. Maneuver theory, however, offers much more to the professional officer trying to understand the operational level of war. The concepts of tempo, mass, potential momentum, and center of gravity can all be translated into individual components of warfighting power, whether on the ground or in the air.

In Chapter One, Richard Simpkin's criteria for the operational level of war was defined. Those criteria were used to create an operational

paradigm which posited a mission one remove from the strategic aim, a dynamic, self contained, closed loop system. The system had six parts composed of both sides' ground power, air power, and will. The only aspect of the paradigm that was missing was the operational commander's ability to create conditions in the air and on the ground which provided successful results out of all proportion to the amount of forces applied. That synergistic effect is the epitome of the operational art. When and how best to use the capabilities of one force to support the other was the theme of this paper.

Ground power is the bread and butter of the operational commander. Only ground forces can seize objectives and defeat other ground forces. However, an army will never be able to defeat a highly disciplined army by itself.² To gain freedom of action on the ground, and to deny the enemy ground and air forces freedom of action, the operational commander relies on airpower.

Against a trained and organized force, airpower will never be able to defeat the army of a determined nation. This is particularly true when that army has modern air defense weapons. By itself it cannot interdict reinforcements and supplies to the point that an army will give up. Nor can it completely isolate the battlefield.³

For airpower to have freedom of action, its airfields and infrastructure must be relatively free from air attack. Since no air force can hope to defend across all fronts, the best way airpower can gain the initiative is to go offensive into the enemy's rear. If successful, the air commander will have gained freedom of action in his own rear, allowing him to generate tactical sorties. The conditions have now been created to

allow ground forces to move large forces (mass and mobility) not only in the friendly rear, but also into the enemy's.

When air superiority is gained, the air support missions of CAS, BAI and AI now have tactical freedom of action to operate. A freely operating fighter force doing CAS and BAI denies the enemy ground force freedom of maneuver at the FLOT and the tactical rear. A freely operating fighter force doing AI denies the enemy ground force freedom of action in his operational rear.

The Soviet army's capture of three key airfields at the Battle of Stalingrad denied their use to the Luftwaffe. Consequently, the Luftwaffe's freedom to generate large amounts of sorties and the corresponding airlift capacity was tempered by the additional distance those aircraft had to fly. The capture of those airfields gave the Soviet VVS something that would not otherwise have been available without large battles of attrition: freedom of action over the Stalingrad pocket.

SIGNIFICANCE OF THE CONCLUSIONS

"Operational art still focuses on the attainment of strategic objectives through the design and conduct of campaigns."⁴ This thesis has offered ways for operational joint staffs to use the characteristics of ground and airpower to achieve strategic objectives. No longer can the army and air force officer be focused at the tactical level. The campaign plan must be integrated and the officers in the command must understand its intent.

The most significant concept proposed by this study is that airpower has a place in maneuver theory. Properly applied, concentrated airpower

creates conditions at the operational level which can insure success at the tactical level for ground forces. The successful tactical engagement can in turn insure success at the operational level. The concepts of SEAD and ground support of minimum risk routes as an operational activity should be an integral part of maneuver theory.

In conventional warfare, a technological innovation bestows a tactical advantage only until the enemy learns how to cope with it.⁵ Once the enemy has adjusted, the principles of war, especially those possible rules enumerated at the beginning of this chapter, become predominant again. The operational commander must be able to integrate the combined power of his ground and air forces to provide a synergistic whole to his outnumbered forces. Each force offers characteristics that can complement the other. To ensure we derive the optimum synergism from our air and land team, the officers, planners, and commanders of both components of the team must expand their professional horizons, take the time, and expend the effort to learn what those qualities are.

CHAPTER FIVE ENDNOTES

¹Richard Simpkin, *Race to the Swift* (1985) 30.

²Sir John Slessor, "The Effect of Air Power in a Land Offensive," in John R. Walker, ed. *The Future of Air Power* (1986): 89.

³*Ibid.*

⁴Ronald M. D'Amura, "Campaigns: The Essence of Operational Warfare." Parameters (Summer, 1987): 44.

⁵Michael J. Morin, "Does NATO need a New Conventional Operational Strategy." Study Project (1980): 74.

APPENDIX I

REVIEW OF LITERATURE

In the West, the recent study of the operational level of war began in the early nineteen eighties. Scholars of Soviet military literature had detected the Soviets' attempt to bridge the gap between strategy and tactics. The use of the operational maneuver group and its association with operational objectives raised eyebrows in the west and caused defense analysts to rethink their perception of modern mobile warfare.¹

The majority of literature in the operational art has been written by experts in land operations, those with an army background. Consequently, these authors have written about the operational art from a two-dimensional point of view. Air Force literature on the subject has been generally limited in scope and restricted to intermediate and senior service school papers.

The standard for all studies of the strategic and operational levels has been Clausewitz's *On War*. Not only is it a book studied by serious scholars of warfare, but Clausewitzian concepts proliferate throughout U.S. Army doctrinal literature. Specifically, Clausewitz's concepts of the "center of gravity" and the "culminating point" form a

significant portion of the basis for U.S. Army warfighting concepts at the operational level.²

Until recently, literature addressing the transition from strategy to tactics had been confusing. The term *la grande tactique* (grand tactics) was adopted by the French and British. It did not withstand the test of time. The Germans used the term *operativ* to show the connection. The Soviets borrowed the term, but called it *operativnyi*. After Soviet writings started addressing *operativnyi*, western writers started realizing the benefit, using the term 'operational.'³ However, it was not until 1986 that courses related to the Operational Level of War were addressed at the Army's Command and General Staff College. It was not until 1989 that the Air Force taught operational warfighting at the Air Force's Air Command and Staff College.⁴

In 1898, General Colmar von der Goltz published *The Conduct of War* in which are found some of the earliest discussions of the operational art ("...marches, the assumption of positions, and combats...is called an 'operation'"). Clausewitz's concept of the culminating point, as well as concentration of mass, envelopments and turning movements are debated. Here, also, is the beginning of a debate over which is better: annihilation strategy, or attrition strategy. Later, he extends the discussion to the operational level with a debate over maneuver theory versus attrition theory.⁵

In 1940, a Colonel on the German General Staff, Hermann Foertsch, wrote *The Art of Modern Warfare*. In his book, Foertsch, who was later to become a general, differentiated between the three levels of war. However, he dismissed operations as merely a "sub-concept" of strategy,

calling operations the "movements of armed forces preparatory to battle..." He did try to equate the levels organizationally with specific sizes of units.⁶

Probably Foertsch's greatest contribution in his book is his attempt to forecast the nature of the next war, WWII. Penetrations, breakthroughs, deep attacks into the enemy's rear are all characteristic of Germany's ultimate use of Blitzkrieg. Here is a picture of mechanized warfare with supporting air forces to achieve "strategic objectives."⁷

More recently in the west, Edward Luttwak's *Strategy, The Logic of War and Peace* analyzes four levels of war[†] as vertical levels, much as they are depicted in Figure 3 on page 19. However, he goes further. Luttwak shows that there are no clear boundaries between the levels, and that, indeed, actions in one level can have a significant impact at other levels.

Another book which analyzes the levels of war using case studies is Allan R. Millet and Williamson Murray's work, *Military Effectiveness*, a three volume set. In their third volume, *Military Effectiveness, The Second World War*, various authors analyze the major national actors of WWII across political, strategic, operational and tactical lines. The interaction of the various levels is clearly demonstrated as the Allies and the Axis fought the Second World War. This volume was particularly helpful for the case study analysis of the Stalingrad and Kursk campaigns, from both the German and Soviet viewpoints.

[†]Luttwak included a fourth level, the technical. The technical level is where comparisons of individual weapon systems are made and fought.

Maneuver theory is the basis for the U.S. Army's change in doctrine in 1982 and the development of the AirLand Battle concept. The idea is not new. To understand how the operational commander fights his war, the Air Force reader must understand the theory behind his concepts, his plans, and his maneuver.

In *Race To The Swift*, the late Brigadier Richard Simpkin details the nuances of the hammer-and-anvil approach to warfare. He explains the relationships between maneuver and firepower, and points out that even in maneuver theory, forces will end up in an attrition oriented battle. Simpkin is especially enlightening because he carefully integrates Clausewitz, Sun Tzu, and Alfred T. Mahan into operational strategy and maneuver theory. His discussion of the development of leverage using a fulcrum and a lever arm is particularly useful because it shows how the commander maneuvers to achieve his operational objectives, and how the TAF might aid him.

For whatever reasons, the discussion of maneuver theory and its uses in a land campaign are just now beginning to flourish in western army doctrine. In FM 100-5 Operations, the U.S. Army discusses a framework for combat that includes the "deep battle." However, as recently 1980, Michael J. Morin observed that there was no doctrine or contingency plans, for large scale meeting engagements for brigade and bigger units.⁸ Even the doctrinal manual on large unit operations, U.S. Army's FM 100-6 Large Unit Operations, does not talk about such matters.

The Soviet Army has been studying and executing maneuver theory in the form of "deep operations" since the 1930s. Kerry Hines wrote an excellent summary of the history of "deep operations" and a review of

current Soviet thinking on the subject in his article "Competing Concepts of Deep Operations," in *The Journal of Soviet Military Studies*. The article gives a picture of high-tempo theater, front and army operations on a modern battlefield.

Most articles in the unclassified literature are restricted to an army's perspective of airpower in a land campaign, and, of course, they were usually written by authors with an army background. Examples are: "Deep Strike in U.S. And NATO Doctrine" (William O. Staudenmaier), "Defence Concepts and the Application of New Military Thinking" (General Hans-Henning v. Sandrart), and "Delay of the Second Echelon: A Realistic Approach" (Edward H. Matthews). Of the remaining articles with airpower themes, most were written about airpower as an unilateral operation unto itself. None were written about the integration of tactical air support to operational maneuver.

A few of these articles and papers include: Dennis L. Cole's Army War College Paper "A conceptual Design For Modeling The Air War in Central Europe" and R.A. Mason's "The Decade of Opportunity, Air Power in the 1990's." Probably the closest article to the subject is Air Vice Marshal (AVM) John Walker's article "The Conundrum of Air-Land Warfare." In this article, Walker discusses airpower at the operational level, in his case, the theater level. On the other hand, he does not discuss the support of a "deep battle" by ground forces or support of an encircled force, all elements of a combined/joint operational level fight.

German Army General Hans Henning v. Sandrart, commander-in-chief of NATO's Allied Forces, Central Europe, has written extensively about warfare at the operational level. His central theme is that the battle

across the theater must be coordinated and integrated, regardless of the arm, or the service. See his article: "Considerations of the Battle in Depth."

Most of the reviewed theses and papers address the critical need to "integrate" and "coordinate" air, land, and sea operations. Some addressed technical capability, such as Follow-On Forces Attack (FOFA). Examples of these are Hamilton's "Close Air Support and Battlefield Air Interdiction in the Airland Battle." Others address doctrinal issues. Army officers wrote a few addressing how they wanted air power to support land forces, raising such issues as FOFA, BAI/CAS, and tactical air command and control. However, none addressed the relationship of tactical air operations to operational ground maneuver.

A recent book, published by Air University Press, does address one aspect of operational strategy. Dennis Drew and Snow's *Making Strategy, An Introduction to National Security Processes and Problems* discusses at length the operational level of war and its associated strategy. Ways and means are discussed, as well as the importance of the integration of the operational objective with the strategic goals. However, not discussed is the ground campaign, operational maneuver, or the effect the TAF can have on it.

While this paper is not meant to be a review of the history of air doctrine, it is informative as a background to the literature to understand the state of air doctrine. The principal founders of airpower doctrine, an independent air arm, and strategic bombing are Colonel William Mitchell, Giulio Douhet and Air Chief Marshal Sir Hugh Trenchard. Any additional names listed would only slight those countless others who

had a significant role in airpower development. Needless to say, the Americans and the British entered WWII stressing strategic bombardment as an instrument with which WWII could be won.

In July 1943, Field Manual (FM) 100-20, Command and Employment of Air Power asserted that air forces and ground forces were "co-equal and independent forces: neither was an auxiliary of the other."⁹ That FM specified that there was a hierarchy of priorities for the TAF: air superiority, interdiction and close air support.

David MacIsaac, in "Voices from the Central Blue: The Air Power Theorists," succinctly traces the history of air doctrine after WWII.¹⁰ Tactical air forces took a secondary role to national military strategy of "Massive Retaliation" of the '50s and '60s. In this period, the Korean War was considered an 'anomaly', the exception to the primacy of the strategic nuclear mission. In the transition to a "Flexible Response" strategy, tactical air power began to shed the roles of delivering tactical nuclear weapons, and began to focus on more traditional roles, air interdiction, close air support and, especially, air superiority.

Since 1945, most conflicts have used airpower in only a supporting role. The obvious exceptions are Indochina (1960-75), the Arab-Israeli Wars (1967 and 1973), and the Korean War.¹¹ Even during the recent American invasion into Panama (December, 1989) tactical air power was used primarily in the airlift role. The role of the air force in that operation was focused on the projection of ground power; there was no air threat.

Recently, even in the Air Force, the academic treatment of the operational level of war has been limited. In an Army War College paper

entitled "A Conceptual Design For Modeling The Air War In Central Europe," Air Force Lt. Col. Dennis L. Cole discussed operational art from a purely airpower perspective. The role of the ground campaign in achieving strategic objectives was not addressed.

Where does that leave us vis-a-vis air power and operational maneuver? There is very little written on the subject.

In the unclassified press, the only book by an airpower theorist that even addresses the concept of an air campaign is John Warden's *The Air Campaign*. Colonel Warden couches the Air Campaign in terms that support warfighting at the operational level. He emphasizes that air superiority is the primary TAF mission. If there would be one theme for this book it would be: Air Superiority is paramount, and best achieved by going offensive.

Warden discussed the enemy's air center-of-gravity at length. Warden's logical conclusion was that if one has air superiority, the enemy's center-of-gravity has been eliminated and victory will be a foregone conclusion. Any discussion of the ground campaign in this book was very 'broad brush', and does not specifically address operational situations in relation to ground maneuvers. Nevertheless, it is the only book written by an airpower theorist in the last decade that even discusses the air campaign.

Warden's conclusions can be summarized as follows:

The speed and range of air forces pose special problems and offer special advantages that center around the principles of mass and concentration and their corollary, economy of force.

An air force on the defensive faces greater risk to itself and the total war effort than an air force on the offensive.

Whatever the choices for offense or defense, the air campaign cannot succeed until air superiority is achieved.

Enemy ground based air defenses are targets that will be defeated at times and places of our choosing. Any ground based air defense system has vulnerabilities that reduce its strength.

One way to increase the concentration of air attacks against any set of targets is to retain some air power to meet the unexpected—whether providential or disastrous.¹²

More than a few Air Force writers recognize the problem and are trying to change attitudes. In one recent article in *Airpower Journal* by Air Force Major Robert Chapman, the complexity of the modern battlefield and its impact on the TAF is articulated.

Chapman writes that out of necessity, U.S. Army literature has focused on the operational level of war. Army doctrine sees a highly dynamic battlefield with never before seen firepower. Land commanders must focus not only on the close battle, the tactical battle, if you will, but also on what is coming in the next echelon. "Modern war is likely to see even more intense applications of firepower, even when restricted to conventional weapons."¹³

Later in the article, we see a recognition that operational maneuver can affect tactical air operations:

In the air, combat has always been nonlinear, but at the theater or operational level the fluid battlefield and nonlinear operations raise concerns about the Achilles' heel of air power, the airfield. Long-range firepower, airfield attack munitions, special operations forces, and even air assault or armored breakout forces can threaten all but the most distant theater airfields.¹⁴

Chapman's article is an excellent example of the way airmen see the operational level of war. He generally focuses on the operational problems of massing air forces, of sustaining a surge capability for

higher sortie rates, and even the protection and sustainment of that all important ingredient of airpower, the airfield. There is nothing wrong with this focus. It is the nature of a service's roles and missions that it focuses on the problems that are uniquely peculiar to its special brand of warfare in its own medium.

However, no one has addressed airpower's contribution to the operational commander in a theater of war. Except in broad statements, such as "the primacy of air superiority," there is even less written by air power enthusiasts on how the air commander can support the operational commander.

APPENDIX ONE ENDNOTES

¹Dennis M. Drew and Donald M. Snow, *Making Strategy, An Introduction to National Security Processes and Problems* (1988): 93.

²FM 100-5, *Operations* (1986), p. 179-182 and FM 100-6 *Large Unit Operations* (Coordinating Draft) (1987), p.4-1--4-3.

³Richard Simpkin. *Race To The Swift* (1985): 14.

⁴Major Scott Anderson USAF, Course Director, WS533, Conventional Warfare, Air Command and Staff College, Maxwell AFB, AL. Telephone interview, 14 February 1990.

⁵Colmar v.d. Goltz. *The Conduct of War*. (1895): 16.

⁶Hermann Foertsch, *The Art of Modern Warfare* (1940): 20.

⁷*Ibid.*: 31.

⁸Michael J. Morin, "Does NATO need a New Conventional Operational Strategy." U.S. Army War College Study Project (1980): 50.

⁹David MacIsaac, "Voices from the Central Blue: The Air Power Theorists" in Peter Paret, ed., *Makers of Modern Strategy from Machiavelli to the Nuclear Age* (1986): 638.

¹⁰*Ibid.*: 624-647.

¹¹*Ibid.*: 645.

¹²John A. Warden III, *The Air Campaign: Planning For Combat* (1988): xxiv.

¹³Robert M. Chapman, "Technology, Air Power, and The Modern Theater Battlefield," Airpower Journal (Summer 1988): 44.

¹⁴*Ibid.*: 47.

APPENDIX II

BLITZKRIEG

The foundations of maneuver theory can be found in the *Wehrmacht's* Blitzkrieg and the Soviet's deep operations theory during the interwar years. Germany and the Soviet Union wanted to assess the lessons of World War I in light of the new technologies of war: the tank and the aircraft. If a nation could not be strong enough to win an armed conflict, its operational aims had to be won without fighting a battle.

Using ideas from Marshall Mikhail N. Tukhachevskii and J.F.C. Fuller, the Germans developed a small force of very high quality. The combat worth of this small force was its ability to create, with the speed of its maneuver, surprise at an order of magnitude higher than the rest of the army.¹

Employing either strategic or operational surprise, this force would penetrate to great depth, beyond the enemy reserves, while avoiding battle. This would dislocate the enemy force physically and shatter its commanders psychologically. Any response they could make would certainly be overtaken by events and probably be irrelevant to the German operational aim. With luck the armored spearheads would go far and fast enough to cut the enemy's main communication arteries, perhaps even to seize an undefended center of regional or national government and thus act directly on the enemy's political and popular will."²

The first move had to be a battle in which the enemy was "turned" tactically. The only way to do this was to find and exploit a weak spot in the front lines. The second requirement was that all battles greater than a skirmish had to be avoided, or else the force was bogged down in deployment and the "momentum" was lost. From there, operational depths were strived for.³

During WWII, the Allies perceived, after their initial successes, that Blitzkrieg was primarily "the effect of overwhelming mass in material and manpower applied to an unprepared and irresolute opponent."⁴ In fact, Blitzkrieg was an outstanding use of a smaller, highly mobile force taking advantage of its freedom of action in the operational depths.

By Case Barbarossa, the German invasion of Russia, the blitzkrieg was fully developed. In this campaign, the Wehrmacht was able to accomplish double envelopments on several occasions. It had an uncanny ability to concentrate forces and maneuver at an operational scale, unheard of up to that time.

The Wehrmacht did have problems. At times its forward progress was bogged down because of a technical disparity between the holding and mobile force. The mobile force was composed of tanks, while the majority of the holding force was restricted to motorized transport or foot. The mobile forces were moving so fast the holding force (dismounted infantry) could not keep up. Now there was no anvil. Consequently, the German forces could not maintain the desired momentum and tempo all the way to Moscow.⁵

The distinguishing feature of the blitzkrieg was avoidance of battle.⁶ It is also significant to note, that during conditions where the

Luftwaffe could not provide air superiority, blitzkrieg was less than successful. Armored forces were exposed without adequate air cover or mechanized antiaircraft artillery (AAA).

APPENDIX II ENDNOTES

¹Richard Simpkin, *Race to the Swift* (1985) 30.

²*Ibid.*

³*Ibid.*: 28.

⁴Earl F. Ziemke, "Military Effectiveness in the Second World War," in Allan R. Millett and Williamson Murray. *Military Effectiveness, Vol III, The Second World War* (1988): 292.

⁵*Ibid.*: 302.

⁶Simpkin: 34.

APPENDIX III

SOVIET DEEP OPERATION THEORY

The Soviet model is another example of maneuver theory. It is also better documented and developed than any other version. There were great similarities between the Soviet deep operations theory and German Blitzkrieg. The Soviets strived for a holding force, a break-in battle, or the penetration, and a mobile force to conduct the turning movement.¹

It was the Soviet theorist V.K. Triandafillov, in the 1930s, who started to define deep operations theory in terms of dimensions: frontage, depth, and time of execution. As the Soviet ideas began to fertilize, M.N. Tukachevskii, now considered the father of deep operations theory, wrote about his concern for the vulnerability of forces from air attack. The only possible answer was to concentrate forces as far from the front as possible before deployment.²

About the same period, Kombrig A.N. Lapchinsky, wrote about the Soviet Air Force's (VVS) and the Air Defense Force's (PVO) support of operational ground maneuver. The VVS solution to deep operation theory was to concentrate all air forces at "a given time, on a given front." Command of the air was, first, a defensive air battle over ones own territory. But it included a large effort to destroy the enemy's airfields and infrastructure in the rear.³

The Soviet legacy of Tukachevsky's deep operations theory is the foundation of modern Soviet doctrine. More importantly, modern maneuver theory is the natural progression of Soviet thought.

APPENDIX III ENDNOTES

¹Richard Simpkin, *Race to the Swift* (1985) 42, 49.

²Jacob W. Kipp, "Barborossa, Soviet Covering Forces and the Initial Period of War: Military History and AirLand Battle." The Journal of Soviet Military Studies (June, 1988): 189, 193.

³A.N. Lapchinsky, *Vozdushnaia armia* (Moscow: Gosvoenizdat, 1939), p.144 in Jacob W. Kipp, "Barborossa, Soviet Covering Forces and the Initial Period of War: Military History and AirLand Battle." The Journal of Soviet Military Studies (June, 1988): 204.

APPENDIX IV

AIR AND LAND OPERATIONS

LAND OPERATIONS

Envelopment is the single maneuver on which Blitzkrieg, Deep Operations Theory, and now maneuver theory all rely. The purpose of an envelopment is to "strike quickly at the rearward communications of the enemy, by encircling one, or even better, both of his wings."¹ According to FM 100-5, envelopment avoids the enemy's front, where he may be the strongest, and maneuvers to take the main effort to the enemy's flank to strike at his flanks and rear. The envelopment can develop into an encirclement if the defender's lines of communications (LOC) can be cut. A diagram of the U.S. Army's concept of the envelopment is in Figure 44.²

The encirclements at Stalingrad in November, 1942 and at Cherkassy in January, 1944 are examples of successful encirclements. On the other hand, during the Vistula-Oder operation, many of the German units began to pull out before they were completely surrounded. Consequently, the Soviets could never really create the necessary mass and leverage to destroy them.³

The Turning Movement is a form of the envelopment. However, the penetration is much deeper, and seeks to avoid the enemy's flanks. By

securing key terrain along the enemy's LOCs, the enemy must now "turn" to face the new threat (see Figure 45). Here the elements of maneuver theory begin to present themselves in the "deep battle" concepts of U.S. Army doctrine.

By virtue of the sustainment required for deep operations, the types of forces that could be used here might be limited. For example, the execution of a Corps or Division operation into the enemy's rear would create the same logistics problems for the U.S. as the Soviets have with their OMGs.

The use of airborne or air assault forces well into the operational depth is theoretically possible, especially if the surface-to-air missile threat permits it. Dropping airborne troops is just as much an offensive action from the air as dropping bombs. It can force the enemy to react as well as to turn. The operation requires early success, and a quick link up with ground forces.

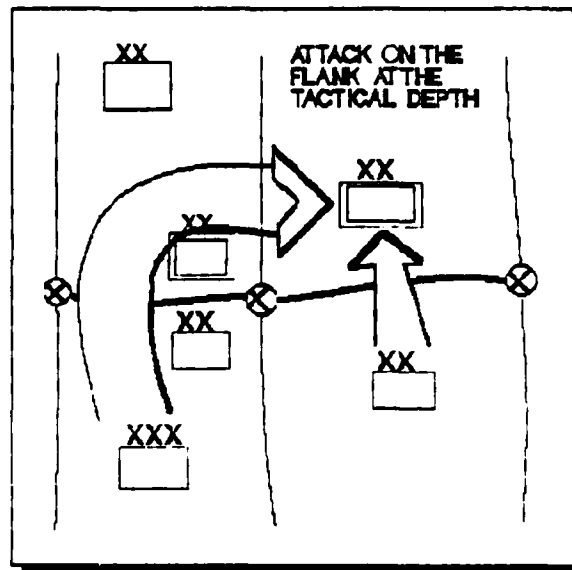


Figure 44 ENVELOPMENT

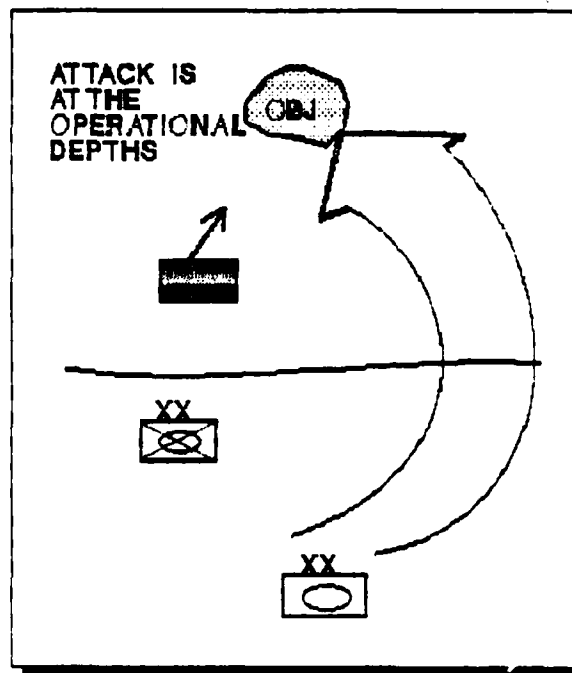


Figure 45 TURNING MOVEMENT

The benefits of such bold actions are exactly what Simpkins has described in *Race to the Swift*. The force doing the turning movement (the mobile force) can now apply pressure against the base of the fulcrum, the holding force, and cause the destruction or surrender of the enemy forces.

The Penetration is used to quickly penetrate the weakest part of the enemy lines in an attempt to "rupture enemy defenses on a narrow front and thereby create both as-sailable flanks and access to the enemy's rear (See Figure 46)."⁴ As mentioned before, it will also be used to create the breakthrough for the mobile force (maneuver theory) and is thus a critical part of the operational maneuver. Examples of

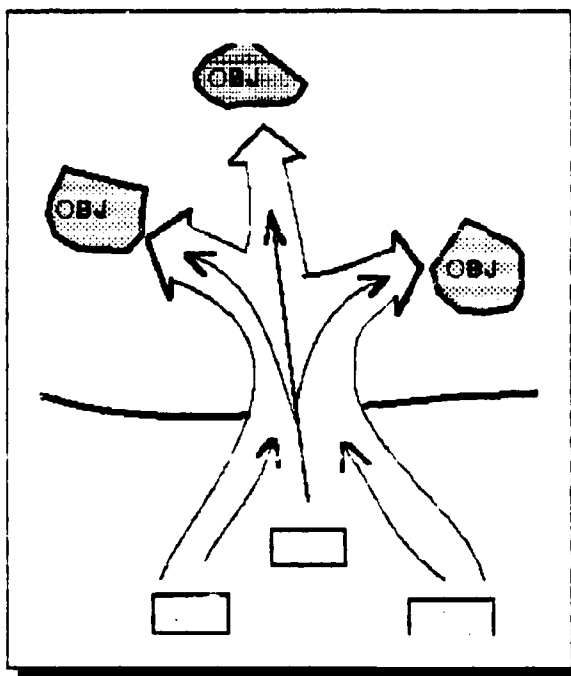


Figure 46 PENETRATION

the penetration and breakout are Operation Cobra, (the breakout from St. Lo in 1944), and the Soviet penetrations at Stalingrad.

Should the penetration be unsuccessful, the only maneuver left to the Operational Commander is the Frontal Attack. It strikes the enemy across the wide front, across the most direct approaches (see Figure 47). It is usually used against light defenses. The Soviets call this "unprepared defenses."

An example of frontal attack at the operational level is the Vistula-Oder operation by the Soviets in 1944. In this situation, the *Wehrmacht* was so weak across the whole front that the Soviets essentially

drove 600 kilometers to the Oder without much concern for German forces they had passed up.

Defensive operations for land forces take form in two different patterns: Mobile Defense and Area Defense. Mobile defense focuses on destroying an attacking enemy force by allowing him to enter a kill zone, an area that exposes him to counterattack or envelopment by a mobile force. This form of defense is the most fluid of the two, be-

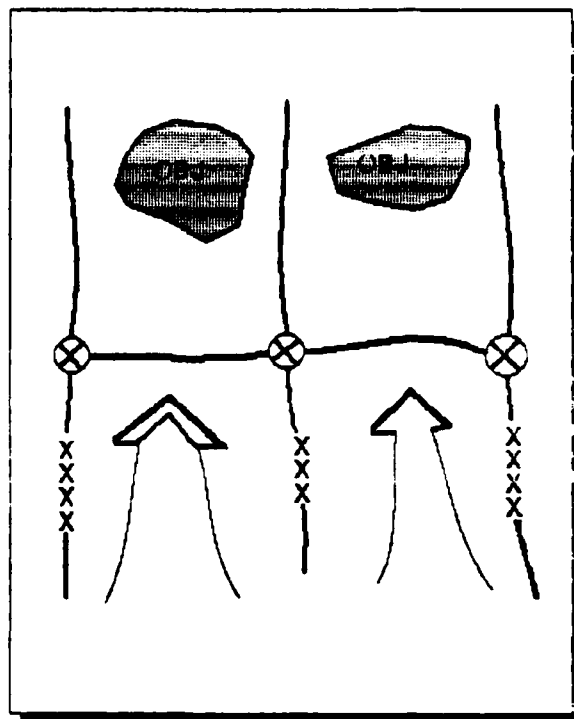


Figure 47 FRONTAL ATTACK

cause it uses a combination of offensive, defensive and delaying action (see Figure 48). The **kill mechanism** is the operative word in this type of defense, because the majority of forces are not forward, but rather back, waiting for the battlefield to be "shaped" around the attacking force.⁵

In contrast, the area defense focuses on the retention of terrain "by absorbing the enemy into an interlocked series of positions from which he can be destroyed largely by fire." Its purpose is to retain ground, and is generally composed of a static framework within which that ground is defended (see Figure 49). As opposed to the mobile defense, the area defense is usually mandatory for infantry forces, be they "light" or "airborne."⁶

When a military force is on the strategic defense, it might find itself in several situations in which the integration and synchronization

of air and land power is particularly sensitive. Those situations might be retrograde operations, attack into a salient, and the encirclement and breakout.

Retrograde operations are made to insure the safety of a force as it moves to the rear or away from the enemy. They gain time, preserve forces, avoid combat under undesirable conditions, or they could draw enemy forces into terrain unfavorable to the attacker.¹ Under such conditions, the retiring force could be under con-

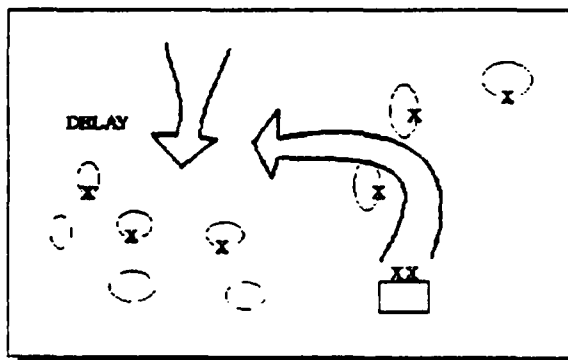


Figure 48 MOBILE DEFENSE

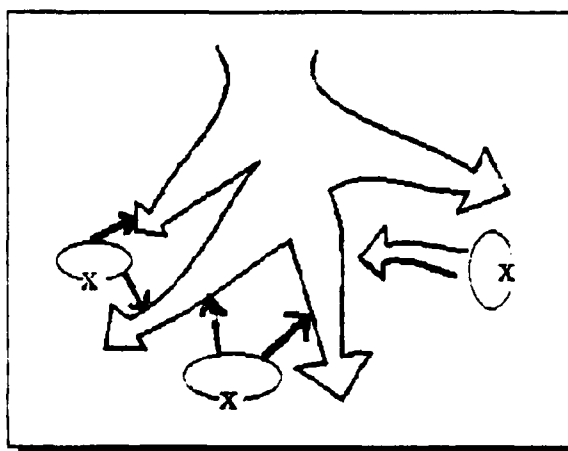


Figure 49 AREA DEFENSE

stant pressure from ground and air units. More importantly, these types of operations will have far reaching impact on the way airpower is employed.

Retrograde operations under conditions of air parity or better allow for an orderly withdrawal, thus facilitating later operations. When air superiority is not present, retrograde operations can take the form of a route. The British 8th Army's retreat after Tobruk is an example of the first situation. The German Army's retreat during the Vistula Oder operation is an example of the second.

In the attack into a salient, the defending force has allowed, willfully or not, the enemy's mobile force into an area behind his own

FEBA. In this case, friendly forces are attempting to cut the salient off at the penetration point, before turning to defeat the force in detail. Examples of this "defensive" situation might be the Battle of the Bulge in 1944 and Manstein's counterstroke in the Ukraine in 1943.

The last defensive situation is the encirclement and breakout. This situation is important because in a highly mobile, non-linear front, the probability of division and larger groups of forces being encircled or cut off from their LOCs is highly likely. WWII provides numerous examples of how encircled forces successfully broke out, many with the support of TACAIR.

AIR OPERATIONS

THE AIR SUPERIORITY CAMPAIGN (OCA AND DCA)

Since the German attack on Poland in 1939, no country has won a war in the face of enemy air superiority, no major offensive has succeeded against an opponent who controlled the air, and no defense has sustained itself against an enemy who had air superiority. Conversely, no state has lost a war while it maintained air superiority, and attainment of air superiority consistently has been a prelude to military victory.⁸

U.S. Air Force doctrine states that counterair objectives are "to gain control of the aerospace environment." It defines three types of counterair operations which help to gain control of the air: Offensive Counter Air (OCA), Suppression of Enemy Air Defense (SEAD), and Defensive Counter Air (DCA).⁹

Air Superiority gives the operational commander freedom to maneuver he would not otherwise have. Freedom to maneuver is a prerequisite to maneuver warfare:

To be superior in the air, to have air superiority, means having sufficient control of the air to make air attacks on

the enemy without serious opposition and on the other hand, to be free from the danger of serious enemy air incursions.¹⁰

Control of the aerospace environment is a matter of degree. An air force can establish air superiority, air parity, a favorable air situation, or local air supremacy. These are all stages in an air force's ability to gain and maintain any measure of that control.

At the top of the scale is *Air supremacy*. Air supremacy is "that degree of air superiority wherein the opposing air force is incapable of effective interference. Air supremacy refers to a wider and more extensive control of the air as in an area of operation."¹¹ During the Vietnam war, the U.S. enjoyed air supremacy over the airspace of South Vietnam.

Air Superiority is achieved "when aerospace forces have the freedom to effect planned degrees of destruction while denying that opportunity to the enemy."¹² Once achieved, it must be maintained or the operational commander will lose it. During Case Barborossa, the Luftwaffe successfully destroyed the Soviet Air Force in 48 hours. However, a year and half later, in November 1942, the Soviet Air Force (VVS) had successfully rebuilt to the point it could go back on the strategic offensive.

A similar situation occurred during the Battle of the Bulge. The Luftwaffe launched a last ditch OCA campaign with 700 fighter and fighter-bomber aircraft. They destroyed 150 aircraft on the ground and forty in the air. But their attempts had little, if any, effect.¹³ The point is that even with "air superiority," the pressure must be maintained, or else the enemy will be able to concentrate a large mass in a small time and space.

Local air superiority is a term that is often used, especially by Army officers at the tactical level. In the context of land warfare it can have two meanings, depending on how it is used. Most often, the land commander uses it to mean the establishment of air cover for a surface operation. A perception exists that the air commander can place barrier combat air patrols (BARCAPS) and topcover over the area of operations (AO) which will absolutely deny access to enemy air, and thereby ensure freedom of movement for the ground forces. The land commander may well assume, if he is under air attack, that because he does not see friendly air roaming over his assigned AO, his air force is not providing support.

In its other sense, local air superiority suggests a phase in an air campaign similar to a breakthrough operation on the ground. In one case, the air superiority might be established in a limited space and time to support a fighter penetration across an enemy FLOT and its associated air defenses. Not only are air force electronic support assets used, but army suppression of enemy air defenses (SEAD) might also be called upon to insure the success of the penetration, both coming and going. Local air superiority in this case provides air forces the freedom of action necessary to cross the FLOT.¹⁴

Another case in which local air superiority would be critical would be during a major operational maneuver on the ground. Air superiority in a limited time and place provides operational freedom of maneuver for the mobile force: freedom from air attack. To support this operation, the air commander must not be "defensive" in his mind set, but "offensive." His support might best be offered by conducting an OCA campaign against those enemy airfields in a position to effect the friendly operational maneuver.

He conducts those operations in such close proximity in time that the enemy cannot react with air reinforcements, or airfield repair.

John Warden does admit that local air superiority can make sense for a "short operation" such as passing a naval fleet through a strait or near a land mass. And it is certainly possible that for a land operation of short duration, the air commander might be directed by the operational commander to weight his support toward that ground maneuver without establishing air superiority.¹⁵

However, Warden also believes that the force ratios needed to defend and support a counterattacking ground force may not justify such an effort. It may take the entire resources of all the tactical air forces in the area of operations to support the maneuver, to the exclusion of all other missions. That sort of effort can lead to disaster. Look at the Luftwaffe's attempts to resupply the 6th Army in the Stalingrad pocket in December 1942 and January 1943. Aside from the fact that the Luftwaffe did not have the airlift assets to accomplish the mission, it was also incapable of achieving local air superiority because it did not provide the fighter forces or assign the mission of air superiority over the pocket. The Luftwaffe's airlift was massacred in a vain attempt to resupply the 6th Army. Therefore, "for sustained operations, air superiority is essential."¹⁶

Local air superiority is fleeting at best. In an environment of air parity, where neither side has numerical or technological advantage, the superiority may disappear as fast as it developed. It is a state that no operational commander would be confident in as insurance for the freedom of action of his own ground maneuver.¹⁷

"Theory alone would suggest that surface warfare cannot possibly succeed if the surface forces and their support are under constant attack by enemy aircraft."¹⁸ Literature is ripe with vignettes of the impact a loss of air superiority has on the enemy force. After the Normandy invasion, the Panzer Lehr Division took 80 hours to travel what normally would have taken 12 hours. They arrived with only 50% of their combat power.¹⁹

Another example of the effect a lack of air superiority has on a maneuver force can be found in the Soviet retrograde operations to Moscow in 1941. The Luftwaffe succeeded in destroying the Soviet Air Force (VVS) in the first few days of Operation Barborossa. As the Soviet Army fought their way back to Moscow in the fall and winter they received no support from the VVS.

As lucrative targets, the large mechanized formations needed protection from German air attacks. The Soviet Air Force devastated on the ground by the German Luftwaffe in the opening hours of the attack, simply was not available to protect the ground forces. Only rudimentary air defense existed in all armies during the war. The mechanized corps could not move over Luftwaffe dominated terrain, missed start times for attacks and suffered heavy, irretrievable losses.²⁰

Even today, the U.S. Army's Command and General Staff College (CGSC) in its premier tactics courses recognizes the primacy of air superiority. In one practical exercise, fashioned after a European mid-high threat scenario, the following was briefed as an operational requirement for a Corps level exercise: The Central Army Group would "build up operational reserves while gaining air superiority..."²¹

"If air superiority is accepted as the first goal, then clearly all operations must be subordinated--to the extent required--to its attainment."²² Inevitably this means that all forces must be attuned to, and

support, the operational "main effort." Therefore, if in the first days of the war, the operational commander designates his air force as the main effort, one could assume that, where possible, all land force assets should be used to support the air superiority effort. This concept is explored in greater depth in Chapters Three and Four of this study.

OFFENSIVE COUNTER AIR (OCA)

The offensive counter air mission (OCA) supports the ground forces in the close, rear and deep battles by reducing the enemy's capability to attack from the air in those three regimes. It provides freedom of action that commanders in these three areas would not otherwise have.²³

Air Force doctrine states that OCA is "aerospace operations conducted to seek out and neutralize or destroy enemy [air] forces at a time and place of our choosing." These are operations conducted in the enemy's air environment, his rear area. It is accomplished by striking the aircraft and the infrastructure that supports those aircraft: runways, POL, and C³, including ground controlled intercept (GCI) radar.²⁴

An offensive approach has many advantages. It keeps the initiative and forces the enemy to react. It carries the war to the enemy. It makes maximum use of aircraft and keeps great pressure on the enemy. Finally, assuming the offensive operations are against an appropriate center of gravity, collateral damage probably will be inflicted on facilities that would be attacked in the next phase of operations.²⁵

Strikes against enemy airfields is the sine qua non of OCA. The theory, substantiated by numerous studies, is that disrupting airfield operations, even if for a short period of time, is the best way to prevent the forces at that airfield from ranging throughout the length and depth of the FLOT. "...to allow an enemy unimpeded use of his airfields, from

which he could fly to participate in an air-land battle, would be to grant him an unacceptable and possibly decisive advantage."²⁶

OCA can make significant contributions to a campaign. It can deny the opponent sanctuary to rearm and refit aircraft into the air superiority role. This reduces the number of enemy fighters that friendly air superiority fighters must contend with. OCA can delay fighter takeoffs, or leave numerous fighters airborne in holding patterns waiting to land or divert to serviceable airfields. This disrupts the enemy air commander's ability to mass forces, to concentrate them in successive operations along the front.²⁷ OCA, therefore, should be timed so as to correspond with the combined arms battles occurring on the ground.

One historical example of how offensive counter air can support the land campaign can be found in the Korean war. When the Chinese entered the war, they brought a new threat that had never been a factor before in that conflict: a fighter threat flying from political sanctuaries across the Yalu River. In this Case IV scenario (see Figure 7), the only way to protect forward bases and the ground LOCs which were open to attack was to shift from a maximum close air support effort to an offensive counterair effort. This switch in strategy featured:

- Offensive air patrols along the Yalu.
- Attacks against forward staging bases from which MIGs might strike airfields and the 8th Army, and
- Intensive attacks against the main supply lines of the advancing Chinese army.²⁸

With air supremacy forward of the Korean front, the U.S. Army never had to operate in a condition which required a response to enemy air action.²⁹

During the invasion of Russia by Germany, Case Barbarossa, the Luftwaffe attacked the Soviet Union on June 22, 1941. In 48 hours, the

Luftwaffe attacked 66 airfields with 637 bombers and 231 fighters. They destroyed 1200 Soviet aircraft, 800 on the ground. The Luftwaffe established the freedom of action the outnumbered Wehrmacht needed initially to defeat the Soviet Army in 1941.³⁰

In the 1967 Arab-Israeli War, the Israeli Air Force (IAF), in an aggressive OCA campaign, attacked Egyptian, Iraqi, Syrian and Jordani airfields. In a single stroke, the IAF established air supremacy.

Three important points about OCA should be made. The first is that even with new airfield denial weapons, the closure of an air base will most likely be temporary, and constant attention will have to be paid to it to insure its closure.

The second is that the results of OCA are likely to be unspectacular at the operational level.³¹ The long-range strike aircraft are not flying over the FLOT, the forces that are destroyed or damaged are not tanks, APCs and logistics vehicles, but rather their airpower equivalent: fighters, support aircraft, and airfield infrastructure.

The third point is that even with friendly air superiority the enemy may still go to great lengths to mass ground forces. This is exactly what happened after the Normandy Invasion. During the operational lull prior to the invasion, the destruction of the *Luftwaffe* was the Allied primary objective. Fighters struck airfields that might be used by the Germans as staging bases in western France.³² When the landings finally occurred, Luftwaffe operations over the beachhead were insignificant.

Normandy proved that an inferior and vulnerable ground force operating under an umbrella of air supremacy could triumph. However, while the freedom of action of the allied forces was preserved, the German

freedom of action was not completely taken away. With great difficulty, they were still able to bring up enough forces to seal off the beachhead. It was not until Operation Cobra at St. Lo, seven weeks after Normandy, that the Allies were able to break out.³³

The attack on airfields, and its subsequent effect on sortie generation is still only secondary to the destruction of enemy aircraft. "Sortie count will be an important measure of success or failure but ultimately the enemy commander will be counting aircraft as his primary measure, as will we ourselves."³⁴

DEFENSIVE COUNTER AIR (DCA)

Defensive Counter Air operations are operations "conducted to detect, identify, intercept and destroy enemy [air] forces that are attempting to attack friendly forces or penetrate friendly airspace."³⁵ In DCA operations the destruction of the enemy air forces occurs over friendly lines, one plane at a time. The destruction is accomplished by either friendly air superiority fighters or by friendly air defense artillery (ADA).

In air warfare, the defense may be weaker than the offense. In fact, a case can be made that it is much weaker than its comparable form of warfare in the land environment. This is true because air forces have such tremendous mobility and range they can attack from far more directions than can a comparable land force.³⁶

The speed of attacking air forces makes concentration in defense against them more difficult than in land warfare. For example, if tasked to defend an entire front, the air commander must defend with a relatively

thin forward air defense until he can determine the area or areas through which the enemy is pushing his main effort. This technique, called "corridor busting," attempts to overwhelm the ground and air defenses with a crushing mass. As the force overwhelms the high altitude missile engagement zones (HIMEZ), air defense fighters must be used to plug the gap.³⁷

When the establishment of an enemy corridor is determined, friendly fighter assets must be scrambled or diverted from airfields, sometimes hundreds of kilometers away. In the time it takes for those fighters to arrive, hundreds, if not thousands, of enemy fighters might have already penetrated the corridor. Another reason that the defense is the weaker form is that unlike the defender on land, the airman is not in a prepared position against an exposed attacker. When the two forces converge there is blurring of roles between the attacker and defender at the tactical/technical level.³⁸ Specifically, in a periods of less than a minute, opposing fighters may move from the offense to the defense and back to the offense again.

SUPPRESSION OF ENEMY AIR DEFENSES (SEAD)

SEAD are those operations which "neutralize, destroy, or temporarily degrade enemy air defensive systems in a specific area by physical and/or electronic attack."³⁹ It is a subset of the counterair campaign. The suppression can be done by means of a "hard" kill, using lethal ordnance such as 500 lb bombs, high speed antiradiation missiles, or artillery. Or, the suppression can be done by "soft" kills, usually accomplished with electronic warfare assets.

CLOSE AIR SUPPORT (CAS)

Close Air Support missions support land operations "by attacking hostile targets in close proximity to friendly surface forces."⁴⁰ CAS also requires detailed integration of each air mission with the fire and movement of those surface forces.⁴¹

Historically, the U.S. Army has enjoyed excellent support for the CAS mission in its history. There is one important reason for this. With the exception of the North African campaign in 1942, the U.S. Army has never had to fight without air superiority.

However, in the 1973 Arab/Israeli War the freedom of action that CAS fighters enjoyed over a battlefield was taken away by SAMs and AAA.⁴² The Egyptians' liberal use of the SA-7 Grail, SA-2, and the SA-6 in the Suez area and the Sinai desert took away the IAF's freedom of action over the FLOT. The nature of air warfare had changed.

Not until after the crossing of the Suez by Israeli forces, and their subsequent annihilation of the SA-2 sites on the west side, did the threat become reduced enough for the IAF to fly close air support. The reverse was true in the Golan Heights. Because of political constraints the IAF could not conduct an effective OCA campaign into Syria, and therefore had to restrict its support to CAS.⁴³

This rise in surface-to-air missile (SAM) defenses has complicated the problem of close, accurate, and effective weapons delivery in the CAS role in a mid-high intensity conflict.

The modern conventional battlefield presents us with some difficult problems. The sheer volume of fire at the FLOT may prevent the coordination of air strikes that was the norm in Vietnam. The effect of enemy offensive ECM may well prevent the level of communications required, and we are now faced with a formidable Soviet helicopter threat.⁴⁴

There will be situations when the need for CAS might be greater than the need for air superiority. In those situations, the operational commander must carefully pick his moment for the employment of mass CAS support. Some possibilities might be:

- If the battle is unquestionably the decisive battle of the war;
- If withdrawal is militarily impossible;
- If losing the battle means surrender;
- If the battle certainly will end within a few days; and
- If stopping the enemy positively means no further enemy offensive before friendly air and ground forces can be rebuilt.⁴⁵

Close air support can be effective in many scenarios. However, it tends to be the most effective when the ground situation is dynamic. It can support breakthroughs, or turn the tide in a tactical battle.⁴⁶ This is so because in a dynamic battle, the armored vehicles are moving and are exposed. The ADA vehicles are moving; therefore, they are less effective. And the entire force is moving, causing the logistics tail to move, thus exposing supply convoys and resupply points.

None of these situations are as prevalent during a static ground situation. Vehicles are not moving and do not need as much POL. Ammunition gets greater usage, but it is easier to store and stockpile behind the FLOT until needed. ADA C² is fixed, exercised and placed in positions beneficial to the defense. CAS in these situations will be tremendously difficult to accomplish.

Operationally, there is a use for CAS that the operational commander might consider. He can use the characteristics of airpower in the CAS role as an operational reserve. Here, by massing airpower, he concentrates it in situations where "bursts of power" are needed.⁴⁷ This does not necessarily mean he conserves the assets. Rather, he continues to

employ airpower in priority missions, shifts those assets as an "operational reserve" to a specific place and time on the battlefield, and then returns them to their previous operations.

An example of this use occurred during the 1973 Arab-Israeli War. The Syrian attack across the Golan Heights put the IDF at great risk. In some places on the front, Israeli battalions were down to only a couple of tanks with which to stop the onslaught. The IAF was the only other force available to stop the penetration. "It was a classic example of the use of aerial firepower, concentrated in space and time and very rapidly, to buy time for the ground forces to seal off an enemy breakthrough."⁴⁸

Another example of this use of airpower might be during the penetration and breakout of an OMG, when the force is most vulnerable. TACAIR can have good effect as a tertiary force hitting on the flank. As the ground force blocks the holding force and prevents penetrations in other parts of the FEBA, the TAF surprises the OMG on the flank either in conjunction with a counterattacking ground force or as a separate force.

BATTLEFIELD AIR INTERDICTION (BAI)

The definition of Battlefield Air Interdiction is as follows:

Air operations conducted to destroy, neutralize, or delay the enemy's military potential before it can be brought to bear effectively against friendly forces, at such distance from friendly forces that detailed integration is not required.⁴⁹

This mission is the result of a changing emphasis on attacking enemy main force units as they move to contact, prior to their deployment from march formation.⁵⁰

The primary difference between BAI and the remainder of the air interdiction effort is the near-term effect and influence produced against

the enemy in support of the land component commander's scheme of maneuver.⁵¹ This definition has far reaching consequences for the ground commander. The crux of the problem revolves around the issue of "near term." If a ground commander has reliable information as to the location of an enemy force, but that force is not yet in close contact with his own forces, he really has only a few options available to him.

As a general rule, for most situations in a mid-high intensity conflict, air forces will not have enough sorties to accomplish a successful attrition style BAI campaign. The reasons are:

The requirement for extremely accurate and real time targeting intelligence that is difficult to obtain.

The need to quickly exploit this targeting intelligence by planning and executing strike missions before highly mobile Soviet combat units can move out of the prospective target area.

The extraordinarily high threat air defense environment in and around the target area.

The realization that the [operational commander] will allocate only a certain percentage of available air assets to the interdiction mission.⁵²

Using new technology weapons, such as precision guided munitions (PGMs) or advanced conventional munitions (ACMs), 60% destruction of a single Soviet division requires 300 aircraft sorties. If the current inventory of "dumb," unguided munitions, is used, the same destruction rate would require 2200 sorties.⁵³

Just like CAS, BAI is most powerful when the battle is in progress. It is particularly effective when the enemy is under considerable ground pressure, making him use up his ammunition, his POL, his spare parts and combat vehicles.⁵⁴

Operationally, the problem will be even greater if there is no distinct "front" and the FEBA is nonlinear. Now the difference between CAS and BAI will not be able to be conceptualized in terms of linear FEBAs, FLOTs, and FSCLs. Air-to-surface attacks between the forward line of own troops (FLOT) and the FSCL are close air support, and air attacks beyond the FSCL (excluding airfields) are considered air interdiction. Army doctrine tells us that we may very well find air power providing close air support to ground forces operating deep in enemy territory, well beyond the FSCL.⁵⁵

AIR INTERDICTION (AI)

The Joint Chiefs of Staff Dictionary of Military Terms states that air interdiction consists of those air operations conducted

to destroy, neutralize, or delay the enemy's military potential before it can be brought to bear effectively against friendly forces, at such distance from friendly forces that detailed integration of each air mission with the fire and movement of friendly forces is not required.⁵⁶

In air interdiction, the main targets are the LOCs of the enemy, his ability to resupply and sustain himself with logistics and reinforcement. AI's main purpose is to prevent the arrival of enemy forces and supplies in the combat zones.⁵⁷

Air interdiction is involved with the isolation of the battlefield. It has never changed.⁵⁸ To the ground commander, this term implies that no forces, except those with which he is currently engaged, can get near his positions. The types of targets usually associated with this sort of sanitization include: bridges, viaducts, railway marshalling yards, ports and shipping.

In and of itself air supremacy does not guarantee the success of an air interdiction campaign, or for that matter, the ground campaign. In the Korean War, U.S. forces enjoyed air superiority over the PLOT, yet the front eventually resulted in a stalemate. In Italy, in WWII, the interdiction campaign was successful. Allied air superiority gave the air commander the freedom of action needed to make air interdiction effective. Air interdiction, however, did not force the Germans to retreat. A ground offensive in conjunction with air interdiction was needed to do that.⁵⁹

This concept of merging the air interdiction campaign with the ground campaign is of great importance. With limited resources, there must be a way to measure the effectiveness and priorities of the target sets in the interdiction campaign. As a general rule, those priorities should be in tune with the "main effort" of the operational commander.

If the effort is defensive, then interdiction should be focused on delaying, disrupting and destroying the reinforcement, resupply, and transportation infrastructure of the enemy's "main effort." This concept is crucial, if the interdiction campaign is to be effective.

AI is similar to CAS and BAI in two respects. First, AI is most effective when associated with a major land force operation; when the enemy's plans demand mobility.⁶⁰ "Material and troops are easier to keep away from the battle than to engage at the front. They are easier to destroy when they are in assembly or configured for movement than when they are deployed to do battle."⁶¹

Trains are difficult to detect without real time intelligence. However, the large number of trains required to reinforce might make a

predictable target, especially at the offload points, where a high density of armored vehicles will be assembled.

Targets at a range of 150 KM or more are less quickly felt in the immediate battle. Interdiction this far away from the FLOT gives the enemy considerable latitude to repair vehicles and roads enroute. On the other hand, the objective of delaying and disrupting will have been accomplished to some degree by controlling the rate of reinforcement.

The second similarity of AI to CAS and BAI is related to the principles of war. Concentration and economy of force still apply in air interdiction. Friendly forces must impose defeat on the enemy as fast as possible. If a specific target array or grouping can be determined, the best solution in the offensive mode is to concentrate forces. These forces must be massed in such a way that neither the SAM forces at the FLOT, nor the SAM defenses around the high value targets (HVT), can effectively defend against the concentrated force.

Economy of force is just as important for both the air commander and the operational commander. It is not possible to attack everywhere, just as it is not possible to defend everywhere. Therefore, centers-of-gravity must be developed into prioritized target sets. These priorities must reflect a concentration, focused in space and time, the attack of which will yield the clearest, most effective benefit to the operational commander's scheme of maneuver.⁶²

Interdiction is a substitute for depth⁶³ When interdiction forces are massed, the history of warfare has shown that it is extremely difficult to defeat them, except with a counter-mass out of all proportion to the size of the attacking force. Therefore, every attempt must be made

to insure that the concentration of force is made at the right time and place in a manner that suits the operational commander's scheme.

APPENDIX IV ENDNOTES

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- ¹⁶William W. Momyer, *Air Power in Three Wars (WWII, Korea, Vietnam)*, (1978): 111.
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ACRONYMS

AAA	Antiaircraft Artillery
ACM	Air Combat Maneuvering
ADA	Air Defense Artillery
AO	Area of Operations
AOB	Air Order of Battle
ASOC	Air Support Operations Center
AVM	Air Vice Marshall
BARCAPS	Barrier Combat Air Patrol
C ²	Command and Control
C ³	Command, Control and Communications
CAA	Combined Arms Army
CGSC	Command and General Staff College
DCA	Defensive Counter Air
FEBA	Forward Edge of the Battle Area
FLOT	Forward Line of Troops
FM	Field Marshall
FOFA	Follow-on Forces Attack
GCI	Ground Control Intercept
GOB	Ground Order of Battle
HIMEZ	High Altitude Missile Engagement Zone
HVT	High Value Target
IAP	Israeli Air Force
IDF	Israeli Defense Forces
LOC	Line of Communications
NKAF	North Korean Air Force
OCA	Offensive Counter Air
PGM	Precision Guided Munitions
ROE	Rules of Engagement
SAM	Surface to Air Missile
SEAD	Suppression of Enemy Air Defenses
TACAIR	Tactical Air
TAF	Tactical Air Force
USACGSC	U.S. Army Command and General Staff College
VVS	The Soviet Air Force in WWII
WWII	World War II

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